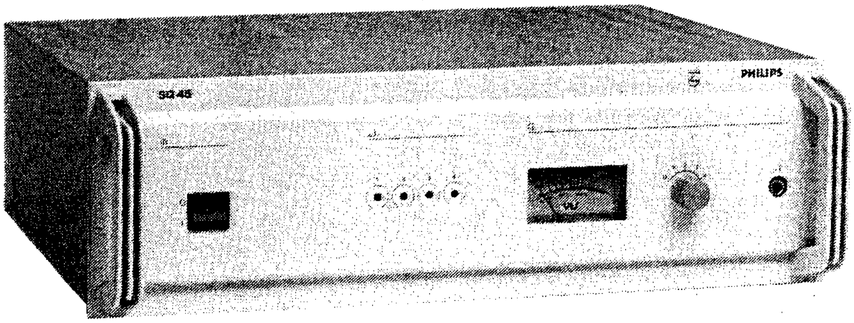
SQ45 Public Address High Performance Power Amplifier



SERVICE MANUAL

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1. INTRODUCTION

1.1. GENERAL

The SQ45 range of high performance audio power amplifiers have been designed for smooth operation in professional Public Address projects. A good reliability, ease of installing, along with good service accessibility have been optimized in their design.

Because of the high level of modular setup and the ease of install and maintain. The aim of this Service Manual is mostly to provide in a First Line Service. At nearly all possible breakdowns or failures interchanging of modules will be the quickest and cheapest repair-method.

1.2. THE TOTAL SQ45 AMPLIFIER RANGE

The mechanical housing for the range of SQ45 amplifiers has been designed to accommodate up to a maximum of four individual amplifiers in a single housing. A number of configurations are available to suit a wide variety of application needs.

The total range of SQ45 Amplifiers can be subdivided into two groups:

- **Low output Impedance Amplifier:**
  - LBB1331/00, /10, /30, /40 : 2 x 80 Watt Amplifier
  - LBB1332/00, /10, /30, /40 : 4 x 80 Watt Amplifier
  - LBB1335/00, /10, /30, /40 : 1 x 320 Watt Amplifier

    - Type numbers ending with /00 and /30 are table top versions including top cover.
    - Versions /10 and /40 are 19" housings for rack mounting and excluding top cover.

NOTE: All above described Low Output Impedance Amplifiers ending with /00 and /10 are out of production since 1991.
All above described Low Output Impedance Amplifiers ending with /30 and /40 are out of production since 1993.

- **100 Volt Output Amplifier:**

- LBB1342/xx	: 1 x 100 Watt amplifier
- LBB1343/xx	: 2 x 100 Watt amplifiers
- LBB1344/xx	: 1 x 200 Watt amplifier
- LBB1345/xx	: 2 x 100 Watt plus 1 x 200 Watt amplifiers
- LBB1346/xx	: 4 x 100 Watt amplifiers
- LBB1347/xx	: 2 x 200 Watt amplifiers
- LBB1348/xx	: 1 x 400 Watt amplifier

- Type numbers ending with /00, /30 are table top versions including top cover.
- Type numbers ending with /10, /40 are 19" housings for rack mounting and excluding top cover.
- Type numbers ending with /20, /50 are D.C. only, 19" rack mounted versions and excluding top cover.

NOTE: All above described type numbers ending with /00, /10, /20, 100V-Output Amplifiers are out of production since 1991. All above described type numbers ending with, /50, and the LBB 1345/30 & /40, 100V-Output Amplifiers are out of production since 1993.

NOTE: Although typenumbers ending with /60 and /70 have formally existed they were never delivered to the market. As a consequence all previous information w.r.t /60 and /70 versions can be ignored. Not will we mention these versions in this manual.

Because of a modular setup, the full range of SQ45 amplifiers can be built up with following modules:

- 1 x 100W Amplifier Module
- 1 x 200W Amplifier Module
- 2 x 100W Amplifier Module
- 1 x 200W Slave Amplifier Module
- Monitor Board
- REM-DC,AC Powersupply SQ45
- REM-DC Powersupply SQ45

Depending on the desired amplifier configurations, the following amplifier modules are mounted in the SQ45 amplifier:

- LBB1331/xx: 1 x (2 x 100W) Amplifier module
- LBB1332/xx: 2 x (1 x 100W) Amplifier module
- LBB1335/xx: 2 x (2 x 200W) Amplifier module

- LBB1342/xx: 1 x (1 x 100W) Amplifier module
- LBB1343/xx: 1 x (2 x 100W) Amplifier module
- LBB1344/xx: 1 x (1 x 200W) Amplifier module
- LBB1345/xx: 1 x (2 x 100W) Amplifier module
  and 1 x (1 x 200W) Amplifier module
- LBB1346/xx: 2 x (2 x 100W) Amplifier module
- LBB1347/xx: 2 x (1 x 200W) Amplifier module
- LBB1348/xx: 1 x (1 x 200W) Amplifier module
  and 1 x (1 x 200W) Slave Amplifier module

NOTE:
- For all /00, /10, /20, /30, /40, /50 amplifiers, the before mentioned Amplifier module configuration is used.
- Differences between (/00, /30) and (/10, /40) versions are found in the Ventilator-Module and some mechanical differences, caused by the way of installing.
- Differences between (/00, /30) and (/20, /50) versions are found in the Ventilator-Module, the Power-Supply (only DC-version /20 and /50) and some mechanical differences, caused by the way of installing.

2. TECHNICAL DATA

Technical data : applicable to all amplifiers unless otherwise stated.

Mains supply : 110V, 127V, 220-230V, 240V at 50 - 60Hz
- Inrush current limiter : 30 A

Emergency Battery supply : +48V nominal (polarity protected)
- Inrush current limiter : 1 A

Power Output	Vdc(min.)	Vdc(nom.)		Vdc(max.)
with Emergency supply :	42V	48V	64V	73V
- Power output related to rated Output Power at 1kHz :	-4dB	-3dB	0dB	+1dB

Power consumption (max.) for -> 4 x 100Watt, 2 x 200Watt, 1 x 400Watt Amplifiers.

Mains supply voltage
- at rated output power-3dB: 1200VA
- at rated output power -8dB (VU=0) : 500VA (full signal, VU=0)
- no audio signal : 55VA

Battery Supply 48V DC
- at rated output -3dB : 10A
- at rated output -8dB : 5A (VU=0)
- no audio signal : 0.6A

Switch on delay time : ≤ 4 seconds

Audio ('music') input **Balanced**
Input sensitivity : 0.5 - 10 Volt (adjustable)
Input impedance : 10 kOhms.

Priority ('call') input **Balanced**
Input sensitivity : 1 Volt (0.5V using eg.jumper S3)
Input impedance : 10 kOhms.

Surveillance ('test') input **Balanced**
Input sensitivity : 500 mV (20kHz) for rated output -20dB.
Input impedance : 10 kOhms at 20kHz

Signal-to-noise ratio : > 91dB (typical) >87dB flat
Cross talk attenuation : > 70 dB at 5 kHz
Frequency response (-10dB) : 50 to 20.000 Hz (-3dB)
Distortion (THD) : < 0.5% at rated power at 1 kHz.
Interference : < -50dB for field of 3 V/m
Power bandwidth (-3dB) : 50 to 20.000 Hz.(THD = 2%) (-3dB)

Monitor output : Headphone impedance 8 - 600 Ohms

VU-meter : 'O'mark = 40V +/- 0.5 dB at kHz on 100V output

Safety : according to IEC 65 and BS 415

Environmental conditions
Operating temperature : -10°C min. to +55°C max.
Storage temperature : -40°C to +70°C
Relative humidity : <95%

Dimensions (H x W x D) : 140 x 440 x 360mm (3HE 19"rack height)

This product is manufactured to comply with the radio interference requirements of the Council Directive of 4th November 1987/308/EEC.

Output Data Low Output Impedance Amplifiers per Amplifier Channel

	80W	320W
Rated output power: (per IEC 268 - 3)	80W	320W
Minimum Load Impedance:	4 Ohm	4 Ohm
Configuration per Type Number:		
LBB 1331/xx	2 x	-
LBB 1332/xx	4 x	-
LBB 1335/xx	-	1 x

Output Data 100 Volt Amplifiers per Amplifier Channel

	100W	200W	400W
Rated output power: (per IEC 268 - 3)	100W	200W	400W
Maximum load capacitance			
100 V output	50 nF	100 nF	200 nF
70 V output	100 nF	200 nF	400 nF
50 V output	200 nF	400 nF	800 nF
Minimum Load Impedance:			
100 V output	100 Ohm	50 Ohm	25 Ohm
70 V output	50 Ohm	25 Ohm	12.5 Ohm
50 V output	25 Ohm	12.5 Ohm	6 Ohm
Configuration per Type Number:			
LBB 1342/xx	1 x	-	-
LBB 1343/xx	2 x	-	-
LBB 1344/xx	-	1 x	-
LBB 1345/xx	2 x	1 x	-
LBB 1346/xx	4 x	-	-
LBB 1347/xx	-	2 x	-
LBB 1348/xx	-	-	1 x

Weight (approx. kg. unpacked)		/00 /30	/10,/40	/20,/50
- LBB 1331	2 x 80 Watt	11.2	9.7	--
- LBB 1332	4 x 80 Watt	14.8	13.3	--
- LBB 1335	1 x 320 Watt	16.3	14.8	--
- LBB 1342	1 x 100 Watt	13.0	11.5	8.5
- LBB 1343	2 x 100 Watt	14.2	12.7	9.7
- LBB 1344	1 x 200 Watt	13.1	11.6	8.6
- LBB 1345	2 x 100 Watt + 1 x 200 Watt	19.7	18.4	12.9
- LBB 1346	4 x 100 Watt	20.8	19.3	14.0
- LBB 1347	2 x 200 Watt	20.1	18.6	13.3
- LBB 1348	1 x 400 Watt	17.9	16.4	11.1

3. FUNCTIONAL DESCRIPTION

3.1. GENERAL

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Each individual amplifier module has two balanced audio inputs;

- a '**music**' input, with adjustable pre-set level control, for (continuous) background music, and
- a '**priority**' input with fixed input level for (occasional) paging and other calls.

The 'music' input is normally active until a call is made, at which time the in-built relay switches the amplifier to the 'priority' input, overriding the music signal and its volume setting. When the call is finished the relay switches the amplifier back to the music input and the music signal resumes at its normal level.
The change over from one input to the other can be controlled remotely.

A test input is provided, into which an inaudible signal of maximum 20KHz may be injected. This signal is sampled at the output to provide continuous monitoring of correct amplifier functioning. Extra equipment must be used to sample the signal (e.g. The Amplifier Surveillance Board from the SM40 range may be used).

The 100V transformer coupled output may be tapped at three different voltages (100V, 70V and 50V). Alignment and monitoring are accomplished via a four position selector switch for monitoring individual amplifiers via the VU-meter and headphones.

The SQ45 unit can be powered with an emergency 48V DC battery supply. An automatic switch-over device switches to the battery supply in the event of a mains failure, or if there is a significant drop in the mains supply.

3.2. CONTROLS

- Mains on/off switch
- Sensitivity control pre-set for Ch. 1
  Sensitivity control pre-set for Ch. 2
  Sensitivity control pre-set for Ch. 3
  Sensitivity control pre-set for Ch. 4
- Output level VU-meter plus illuminated scale (mains on).
- Four position selector switch for monitoring individual amplifier channels via the VU-meter and headphones.
- Headphone socket (6.3 mm standard jack socket).

3.3. LOUDSPEAKERS FOR 100, 70, OR 50 VOLT SYSTEMS

Loudspeakers with suitable matching transformers can be connected in parallel with the 100V, 70V or 50V outputs as long as the total power does not exceed the nominal output power rating of the amplifier. 100V loudspeakers connected to the 100V output will consume their nominal power. If, however, 100V loudspeakers are connected to the 70V output, then the loudspeakers power consumption will be equal to one half of their nominal rated power. This means that twice as many loudspeakers can be connected without overloading the amplifier.
Similarly, if 100V loudspeakers are connected to the 50V output they will only consume a quarter of their nominal power and an increase of up to four times as many loudspeakers is possible.

3.4. IN-PHASE CONNECTION OF LOUDSPEAKERS

Disturbing effects may occur, particularly when loudspeakers are mounted close together, which are caused by the loudspeakers being connected in anti-phase.
To ensure an in-phase connection in 100V systems, all similar loudspeaker terminals (in most cases one terminal is marked with a red dot) must be connected to the same wire on the distribution cable.

3.5. PARALLEL CONNECTION OF AMPLIFIER INPUTS

The pre-amplifier output of, for example, a mixing amplifier, may be connected to the input of this amplifier and to the inputs of several other power amplifiers in parallel. Public Address systems of practically any wattage can be built by using this method of connection.

3.6. CONNECTORS

- 5 pole 180° DIN-type plugs (not supplied)
- 12-pole Mate-N-Lock connectors

On delivery the amplifier is supplied with a small plastic bag containing two 12-pole Mate-N-Lock blocks, complete with contact pin ejector tool. When fitting the contact pins to the external wiring, they may be either soldered or crimped.

4. INSTALLATION INSTRUCTIONS

4.1 GENERAL

The installation work can be divided into three stages:

1. Preparation of the unit itself
2. Preparation of the rack cabling
3. Mounting the unit into the rack

They will be discussed separately

4.2 1. PREPARATION OF THE UNIT

The following can best be completed prior to mounting the unit into the 19"rack:

- **Mains supply**
  - The unit as supplied is suitable for mains voltages of 220 230V A.C. For adaption to mains voltages of 110V, 127V and 240V, the required voltage has to be set accordingly. To change the voltage, unplug the long grey coloured screw connector from its connector block and rewire it for the appropriate voltage. Push the connector block firmly back into its place.
  - For mains voltages of 110V and 127V, the 4A mains fuse built into the standard "Europlug" has to be replaced by one of the value of 15A. To remove the mains fuse, first remove the mains power lead from the socket at the rear of the unit. Carefully insert a medium sized screwdriver under the fuse cover's small lip (nearest the socket pins) and gently twist the screwdriver to lever the fuse holder out.
  - A self restoring thermal cut-out operates on the primary winding of the mains transformer.

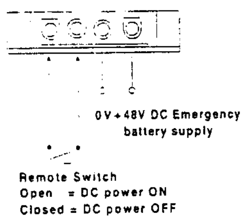
WARNING: When due to excessive temperature, the thermal cut-out shuts down the amplifier, the pilot lamp in the VU meter will not extinguish, the full mains voltage is still present inside the unit.

- The unit is supplied with a 1.2m long mains lead, terminated with a standard IEC two pole earthen mains plug. In some countries it will be necessary to replace this plug with one of a local standard type.

A replacement mains plug must be wired as follows:
Earth - green/yellow
Neutral - blue
Live - brown

WARNING: THIS APPARATUS MUST BE EARTHEN

- **48 Volt Emergency Power Supply**
  - In situations where the mains power supply is unreliable an emergency 48V battery supply may be used. This supply will automatically be switched in whenever the mains power fails.
  - A Mate-N-Lock supply socket is provided to allow the 48V DC battery to be connected.



  - On the Power Supply Board a fuse for the 48V D.C. supply is mounted. The value should be 10Amp.

- **Sensitivity settings**
  - The 'Call'input sensitivity is optimalized for use with the SM30 or SM40 system, therefore set to 1V. The 'music'-input sensitivity is adjustable between 0.5 and 5V to cope with output levels or domestic music sources, e.g. CD player, radio tuner, cassette player, etc.

4.3 2. PREPARATION OF THE CABLING

- **Inputs**

  Each of the amplifiers in the unit is provided with three inputs:
  - **'Priority'** input,
  - **'Music'** input and
  - **'Test'** input.

The connections for these inputs, and the wiring for the remotely controlled selection between 'Priority' and 'Music' input, is made via two, 5-pole 180° DIN-type sockets per amplifier.

The pins of the corresponding plugs are to be connected as described on the following page:

A)	Music input (balanced) ->->->->->->->->->->->->->	(unbalanced)
pin 1:	music signal, live	live
pin 2:	music signal, screen	screen
pin 3:	music signal, live (return)	neutral
pin 4:	not connected	input sel.
pin 5:	input selection* (* see note)	input sel.*

*: To allow remote control of input signal selection:
Plug A:
Music input - pins 2 & 5 linked (relay activated)
Priority input - pins 2 & 5 open

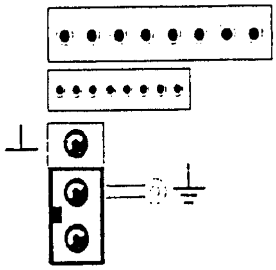
B)	Call and Test input (balanced) ->->->->->->->->	(unbalanced)
pin 1:	call signal, live	live
pin 2:	call signal, screen	screen
pin 3:	call signal, live (return)	neutral
pin 4:	test signal, live	live
pin 5:	test signal, live (return)	neutral

The 'Test' input (pins 4 & 5, plug B) is active under both conditions (music and call).

NOTE: The test input is provided for ultimate use with the SM40 microcomputer controlled surveillance system.

- Outputs
  - Mate-N-Lock sockets are mounted on the rear panel. These are provided with corresponding plugs and serve primarily as transformer output connections to a variety of loudspeakers. Socket X5 is for outputs of amplifiers 2 and 3. Socket X6 is used for the outputs of amplifiers 1 and 4.

- Earthing
  - On delivery the electrical and mechanical earths of the unit are connected.
  - To disconnect the electrical and mechanical earths, jumper S1 must be positioned as shown or removed.



- When two or more units are used in a system, it is necessary to ensure that earth loops are not introduced by earth wiring. In this case, the electrical earth of all units should be linked together, then joined by one wire link to the mechanical earth on one unit only.

- A suitable earthen A.C. mains distribution socket should be provided inside the 19" rack to provide power for the amplifiers.

4.4 3. MOUNTING THE UNIT INTO A 19" RACK (/10, /40, /20 and /50 versions only)

WARNING: SQ45 amplifiers for rackmounting are delivered and installed without top covers.
For safety reasons the SQ45 amplifiers may only be installed in fully closed 19" racks.
Any cover or door must be firmly be secured and may only be opened by authorized personnel.

CAUTION: The temperature inside the rack should never exceed+55°C.
The lifetime of amplifiers that are operated above this temperature limit will strongly decrease.
For detailed instructions how to meet this requirement refer to the SQ45 User Instructions.

1.- SQ45 rack mount versions are standard equipped with rack mount supports. The unit can simply be installed with 4 bolts and washers in any standard 19" rack. No further support is necessary.

2.- If more units are mounted they must be separated with 1HE blind panels. This provides for sufficient airflow between stacked amplifiers.

3.- If other equipment, eg. source units or equalizers, etc, is installed in the same rack it should be mounted underneath the amplifiers. This prevents the source units from being heated up by the amplifier.

4.- After the units are mechanically mounted in the rack they are connected to the audio system.
One '**PRIORITY**' and one '**MUSIC**' input for each amplifier section and the Mate-N-Lock connectors X5 and X6.

5.- Finally the units are connected to the mains supply.

5. INTERCHANGING OF MODULES

5.1. GENERAL

Because of the modular setup of the SQ45 range of System Amplifiers interchanging of modules will be the quickest and cheapest repair method. Some Modules are easy to interchange. For some modules however, explanation about mounting and demounting will be helpful. In the following paragraphs we will explain how to exchange modules in case of system failures.

Mounting of serviced or interchanged modules will be done in reversed order as prescribed below.

5.2. REMOVING AMPLIFIER-MODULES

- First remove the cover of the SQ45 Amplifier by removing 6 screws mounted in the side-panels of the SQ45.
- Remove the two bars across the amplifier-modules by loosening the four screws mounted on the side of the amplifier
- Loosen (do not remove) the screw on the back panel of the amplifier-module
- At the front of the amplifier-module a nut, spring and distance-bush has been mounted on a screw which is positioned through a hole in the heatsink of the amplifier-module. Remove the nut, spring and distance-bush.
- From the module a connection is made to the monitor-module at the front of the SQ45. If the amplifier is a two channel amplifier module (2 x 100W) two wires are connected to the monitor-module. Before unplugging this (or these) wire(s), please note the position of the connector(s), so they will not be interchanged when modules are remounted. Looking at the connectors on the monitor-board and numbering the connectors from one to four from left to right, the cable of amplifier-channel "one" (see backside of SQ45) is connected to connector "one" on the monitor board; cable "two" to connector "two" and so on.
- Unplug connectors at the front of the module
- Remove the Module from the SQ45.

5.3. REMOVING POWER-SUPPLY-MODULE

- First remove the cover of the SQ45 Amplifier by removing 6 screws mounted in the side-panels of the SQ45.
- Remove the two bars across the power-transformer by loosening the four screws mounted on the side of the amplifier
- Remove the two screws at the back panel of the Power-Supply-module.
- Before removing the Power-Supply module the supply-transformer has to be removed:
  - unplug the two connectors from the transformer to the Power-Supply-Module.
  - remove nut and spring in the centre of the transformer
  - remove transformer
  - Unplug connector from mains ON/OFF switch
  - Unplug connector (s) to amplifier modules
  - Unplug connector from monitor-panel
  - Unplug connector to the ventilator
  - Unplug ground connection from back panel of Power Supply-Module to the left side of the housing.
  - On the bottom of the SQ45 two plastic pins are keeping the board of the Power Supply to its place. Gently push the pins inside.
  - Now you are able to take the Power Supply Module out of the SQ45.

5.4. REMOVING MONITORING-PANEL

- First remove the cover of the SQ45 Amplifier by removing 6 screws mounted in the side-panels of the SQ45.
- On front of the SQ45, 4 inbus-screws are mounted. Remove the front of the SQ45 by removing the four inbus-screws.
- The Monitor-Board is kept to its place by two screws mounted at the back of the front and a nut mounted behind the knob for amplifier-monitoring selection.
- Remove the two screws at the backside of the front.
- Remove plastic cap that is inserted in the knob.
- Remove the nut mounted in the knob.
- Remove knob.
- Remove nut which becomes reachable after removing knob.
- Unplug connectors from power-supply and amplifiers from monitoring board.
- Remove monitoring-panel.

6. SPARE PARTS LIST

6.1. GENERAL

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In this chapter the spare parts for the complete SQ45 amplifier range are listed. Because of the modular setup we have identified a "COMMON PARTS"- list for all SQ45 versions. The parts which are defined for the different type of modules are listed seperatly.

Because of the high level of modular setup and the first line service philosophy a limited number of spare parts will fulfil all maintenance and service-requirements.

6.2. SPARE PARTS FOR THE LBB1331, LBB1332, LBB 1335

COMMON SPARE PARTS FOR LBB1331/xx, LBB1332/xx, LBB1335/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	REM-DC/AC-Powersupply Assembly	5322 310 10437
	Monitor Panel Assembly	5322 310 10446
	Output Module Assembly	5322 310 10447
	Fan assembly for /00 & /30 versions	5322 310 10448
	Fan assembly for /10 & /40 versions	5322 310 10451
	Contact Assembly (12p+4p male-socket)	5322 310 10449
	Knob (/00 and /10)	5322 414 30133
	knob (/30 and /40)	5322 414 60769
	Cap for knob (/00 and /10)	5322 414 70042
	Cap for knob (/30 and /40)	5322 462 41842
	ON/OFF mains switch	5322 277 14312
	Handgrip (/00 and /10)	5322 498 50316
	Handgrip (/30 and /40)	5322 498 10466
	Foot	5322 462 50461
	Male socket, 12pins (Ampl.connect.)	5322 265 44111
	Frontpanel (/30 and /40)	5322 447 50149
	Fixing ear 19"rack (/10)	5322 498 50312
	Fixing ear 19"rack (/40)	5322 498 50325
	Housing cover (/30)	5322 447 50152

SPECIFIC SPARE PARTS FOR LBB1331/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(2 X 100W) Amplifier Module	5322 214 91305
	Power Supply Transformer SQ45 200W	5322 310 10436

SPECIFIC SPARE PARTS FOR LBB1332/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(2 X 100W) Amplifier Module	5322 214 91305
	Power Supply Transformer SQ45 400W	5322 310 10438

SPECIFIC SPARE PARTS FOR LBB1335/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(1 X 200W) Amplifier Module	5322 214 91304
	Power Supply Transformer SQ45 400W	5322 310 10438

6.3. SPARE PARTS FOR THE LBB1342, LBB1343, LBB1344, LBB1345, LBB1346, LBB1347, LBB1348.

COMMON SPARE PARTS FOR LBB1342/xx, LBB 1343/xx, LBB1344/xx, LBB1345/xx, LBB1346/xx, LBB1347/xx, LBB1348/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	REM-DC, AC-Powersupply Assembly	5322 310 10437
	REM-DC, Powersupply Assembly(/20, /50)	5322 310 10442
	Monitor Panel Assembly	5322 310 10446
	Output Module Assembly	5322 310 10447
	Fan assembly for (/00, /30)	5322 310 10448
	Fan assembly for (/10, /20, /40, /50)	5322 310 10451
	Contact Assembly (12p+4p male-conn.)	5322 310 10449
	Knob (/00, /10, /20)	5322 414 30133
	Knob (/30, /40, /50)	5322 414 60769
	Cap for knob (/00, /10, /20)	5322 414 70042
	Cap for knob (/30, /40, /50)	5322 462 41842
	ON/OFF Switch	5322 277 14312
	Handgrip (/00, /10, /20)	5322 498 50316
	Handgrip (/30, /40, /50)	5322 498 10466
	Foot	5322 462 50461
	Male socket, 12pins (Ampl. connector)	5322 265 44111
	Frontpanel (/30, /40, /50)	5322 447 50149
	Fixing ear 19"rack (/10, /20)	5322 498 50312
	Fixing ear 19"rack (/40, /50)	5322 498 50325
	Housing cover (/30)	5322 447 50152

SPECIFIC SPARE PARTS FOR LBB1342/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(1 x 100W) Amplifier module	5322 214 91303
	Power supply transformer SQ45 200W	5322 310 10436
	100W output transformer	5322 310 10441

SPECIFIC SPARE PARTS FOR LBB1343/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(2 X 100W) Amplifier Module	5322 214 91305
	Power supply transformer SQ45 200W	5322 310 10436
	100W output transformer	5322 310 10441

SPECIFIC SPARE PARTS FOR LBB1344/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(1 X 200W) Amplifier Module	5322 214 91304
	Power Supply Transformer SQ45 200W	5322 310 10436
	200W output transformer	5322 310 10443

SPECIFIC SPARE PARTS FOR LBB1345/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(2 x 100W) Amplifier Module	5322 214 91305
	(1 x 200W) Amplifier Module	5322 214 91304
	Power Supply Transformer SQ45 400W	5322 310 10438
	100W output transformer	5322 310 10441
	200W output transformer	5322 310 10443

SPECIFIC SPARE PARTS FOR LBB1346/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(2 X 100W) Amplifier Module	5322 214 91305
	Power Supply Transformer SQ45 400W	5322 310 10438
	100W output transformer	5322 310 10441

SPECIFIC SPARE PARTS FOR LBB1347/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(1 x 200W) Amplifier Module	5322 214 91304
	Power supply transformer SQ45 400W	5322 310 10438
	200W output transformer	5322 310 10443

SPECIFIC SPARE PARTS FOR LBB1348/xx VERSIONS

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	(1 x 200W) Amplifier Module	5322 214 91304
	(1 x 200W) Slave Amplifier Module	5322 310 10444
	Power Supply Transformer SQ45 400W	5322 310 10438
	400W output transformer	5322 310 10445

6.4 Spare Parts for Power Supply assembly

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
8	Mains inlet (male)	5322 265 24043
35	Fuse, T4A/250V	4822 070 34002
F1	Fuse, 10A/60V	4822 070 61003

6.5 Spare Parts for DC Power Supply assembly

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
F1	Fuse, 10A/60V	4822 070 61003

6.6 Spare Parts for monitor panel assembly

POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
S1	Switch SRBM15 ALPS	5322 273 30389
16	VU-meter	5322 344 60177
X7	Phone Jack 6,35 (stereo)	4822 267 30522
R1-R4	Potentiometer (20K, preset)	5322 101 11129

6.7 Spare Parts for (1 x 100W) Amplifier Module

	POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	14	Metal clip (for eg. TS21)	5322 401 10783
	15	Protection Plate (for eg. TS21)	5322 466 61949
eg.	BD1	Connector	5322 267 40954
eg.	TS14	BDT88 PNP-Transistor	4822 130 62241
eg.	TS21	BDV65B NPN-Transistor (1st version)	5322 130 44829
eg.	TS21	BDV67B NPN-Transistor (2nd version)	5322 130 63268
eg.	TS21	BDW83C NPN-Transistor (3th version)	5322 130 63687
eg.	TS22	BDV64B PNP-Transistor (1st version)	5322 130 44855
eg.	TS22	BDV66B PNP-Transistor (2nd version)	5322 130 63267
eg.	TS22	BDW84C PNP-Transistor (3th version)	5322 130 63688
	R69,R169	Biasing Current Potentiometer	5322 101 10578
eg.	R83	Resistor OE47 Ohm	5322 113 31041
	F1	Fuse Slow 5 x 20, 5A/250V	4822 070 35002
	K1	Relay Takisawa RY-24	5322 280 70236
	L1,L101	Coil	5322 157 62582
	T1	Transformer	5322 146 30903

6.8 Spare Parts for (1 x 200W) Amplifier Module

	POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	14	Metal clip (for eg. TS21)	5322 401 10783
	15	Protection Plate (for eg. TS21)	5322 466 61949
eg.	BD1	Connector	5322 267 40954
eg.	TS14	BDT88 PNP-Transistor	4822 130 62241
eg.	TS21	BDV65B NPN-Transistor (1st version)	5322 130 44829
eg.	TS21	BDV67B NPN-Transistor (2nd version)	5322 130 63268
eg.	TS21	BDW83C NPN-Transistor (3th version)	5322 130 63687
eg.	TS22	BDV64B PNP-Transistor (1st version)	5322 130 44855
eg.	TS22	BDV66B PNP-Transistor (2nd version)	5322 130 63267
eg.	TS22	BDW84C PNP-Transistor (3th version)	5322 130 63688
	R69,R169	Biasing Current Potentiometer	5322 101 10578
eg.	R83	Resistor OE47 Ohm	5322 113 31041
	F1	Fuse Slow 5 x 20, 5A/250V	4822 070 35002
	K1	Relay Takisawa RY-24	5322 280 70236
	L1,L101	Coil	5322 157 62582
	T1	Transformer	5322 146 30903

6.9 Spare Parts for (2 x 100W) Amplifier Module

	POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	14	Metal clip (for eg. TS21)	5322 401 10783
	15	Protection Plate (for eg. TS21)	5322 466 61949
eg.	BD1	Connector	5322 267 40954
eg.	TS14	BDT88 PNP-Transistor	4822 130 62241
eg.	TS21	BDV65B NPN-Transistor (1st version)	5322 130 44829
eg.	TS21	BDV67B NPN-Transistor (2nd version)	5322 130 63268
eg.	TS21	BDW83C NPN-Transistor (3th version)	5322 130 63687
eg.	TS22	BDV64B PNP-Transistor (1st version)	5322 130 44855
eg.	TS22	BDV66B PNP-Transistor (2nd version)	5322 130 63267
eg.	TS22	BDW84C PNP-Transistor (3th version)	5322 130 63688
	R69,R169	Biasing Current Potentiometer	5322 101 10578
eg.	R83	Resistor OE47 Ohm	5322 113 31041
	F1,F101	Fuse Slow 5 x 20, 3,15A/250V	4822 070 33152
	K1,K101	Relay Takisawa RY-24	5322 280 70236
	L1,L101	Coil	5322 157 62582
	T1,T101	Transformer	5322 146 30903

6.10 Spare Parts for (1 x 200W) Slave Amplifier Module

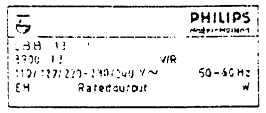
	POS.NR.:	DESCRIPTION	SERVICE CODE NR.:
	14	Metal clip (for eg. TS21)	5322 401 10783
	15	Protection Plate (for eg. TS21)	5322 466 61949
eg.	TS1	BDV65B NPN-Transistor (1st version)	5322 130 44829
eg.	TS1	BDV67B NPN-Transistor (2nd version)	5322 130 63268
eg.	TS1	BDW83C NPN-Transistor (3th version)	5322 130 63687
eg.	TS2	BDV64B PNP-Transistor (1st version)	5322 130 44855
eg.	TS2	BDV66B PNP-Transistor (2nd version)	5322 130 63267
eg.	TS2	BDW84C PNP-Transistor (3th version)	5322 130 63688
eg.	R83	Resistor OE47 Ohm	5322 113 31041
	F1	Fuse Slow 5 x 20, 5A/250V	4822 070 35002
	L1,L2	Coil	5322 157 62582

7. DIAGRAMS

Besides the electrical and the mechanical drawings of the setup of the Amplifiers the following drawings of the several modules are included:

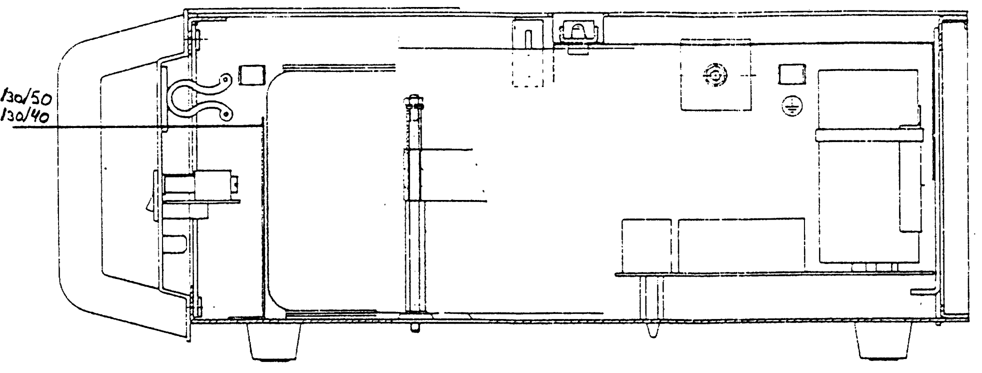
- 1 x 100 Watt Amplifier module
- 1 x 200 Watt Master Amplifier module
- 1 x 200 Watt Slave Amplifier module
- 2 x 100 Watt Amplifier module
- Monitor Board
- Rem-DC/AC-Power Supply
- Rem-DC Power Supply

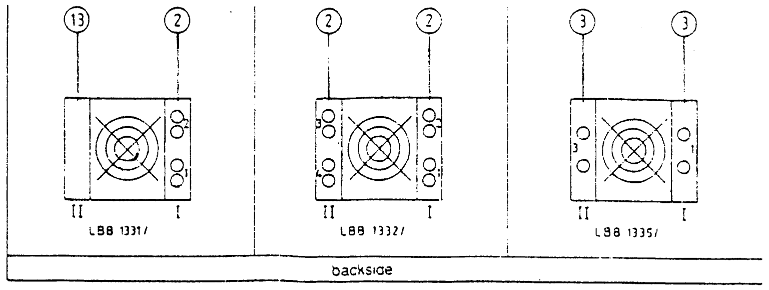
From all these modules the circuit diagram, and the components layout are provided.


PHILIPS
LBB 13
3300 13
V/R
110/127/220-230/240 V ~
50-60 Hz
EH
Rated output
W

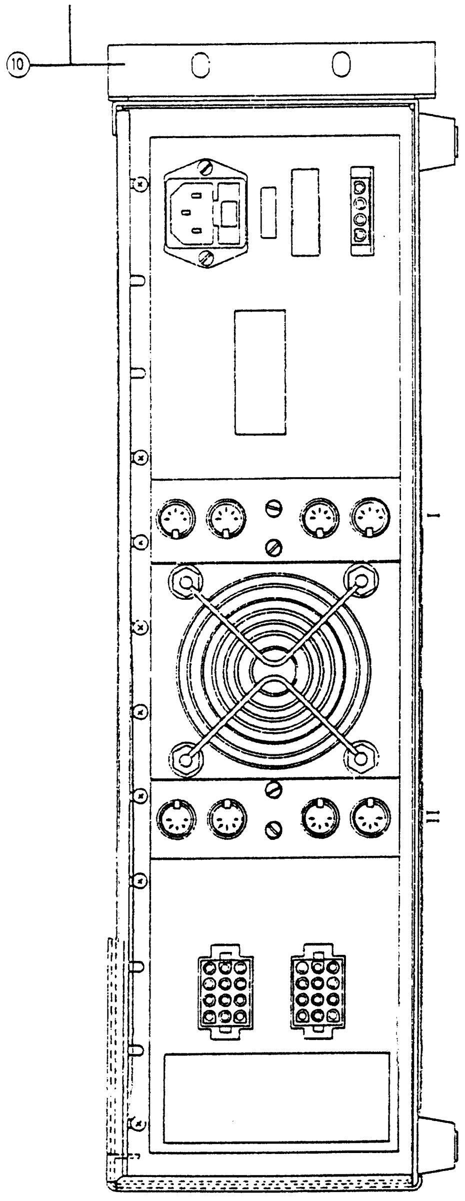
Type plaat schaal 2:1

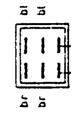
only valid for
LBB 1332/00/20/30/50
LBB 1335/00/10/30/40

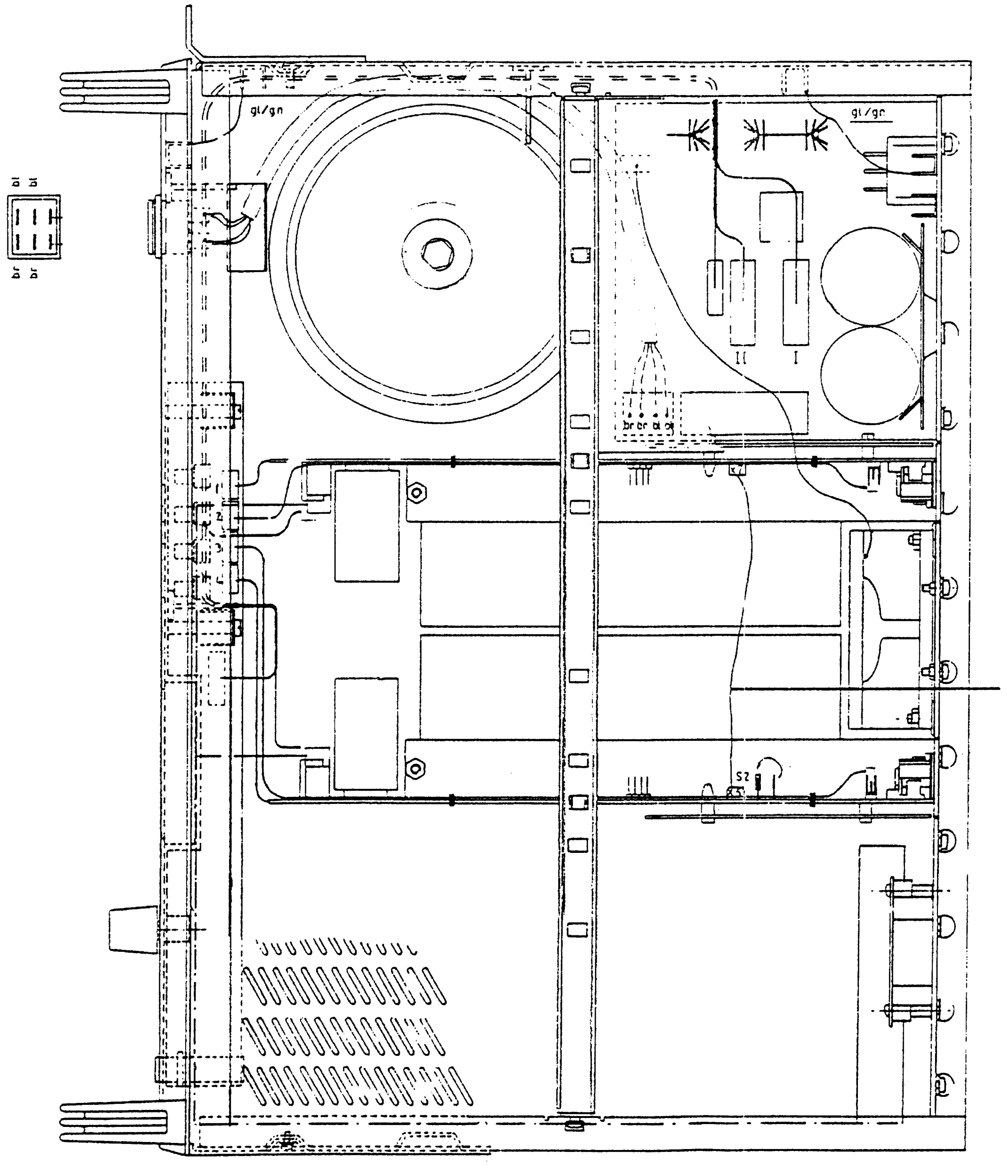



13
2
II
I
LBB 1331/
2
2
3
4
II
I
LBB 1332/
3
3
3
II
I
LBB 1335/
backside

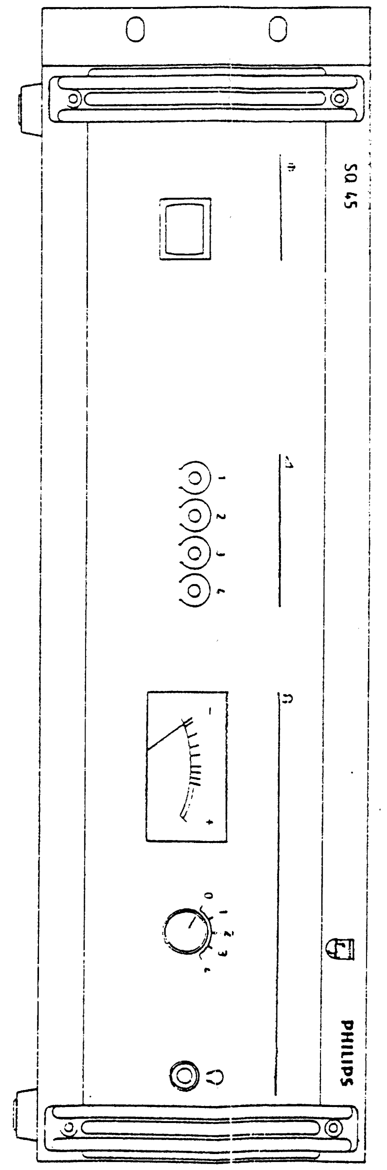
only valid for /10/20/40/50

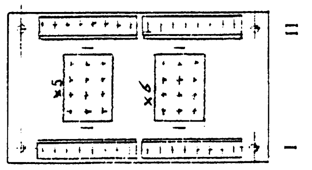


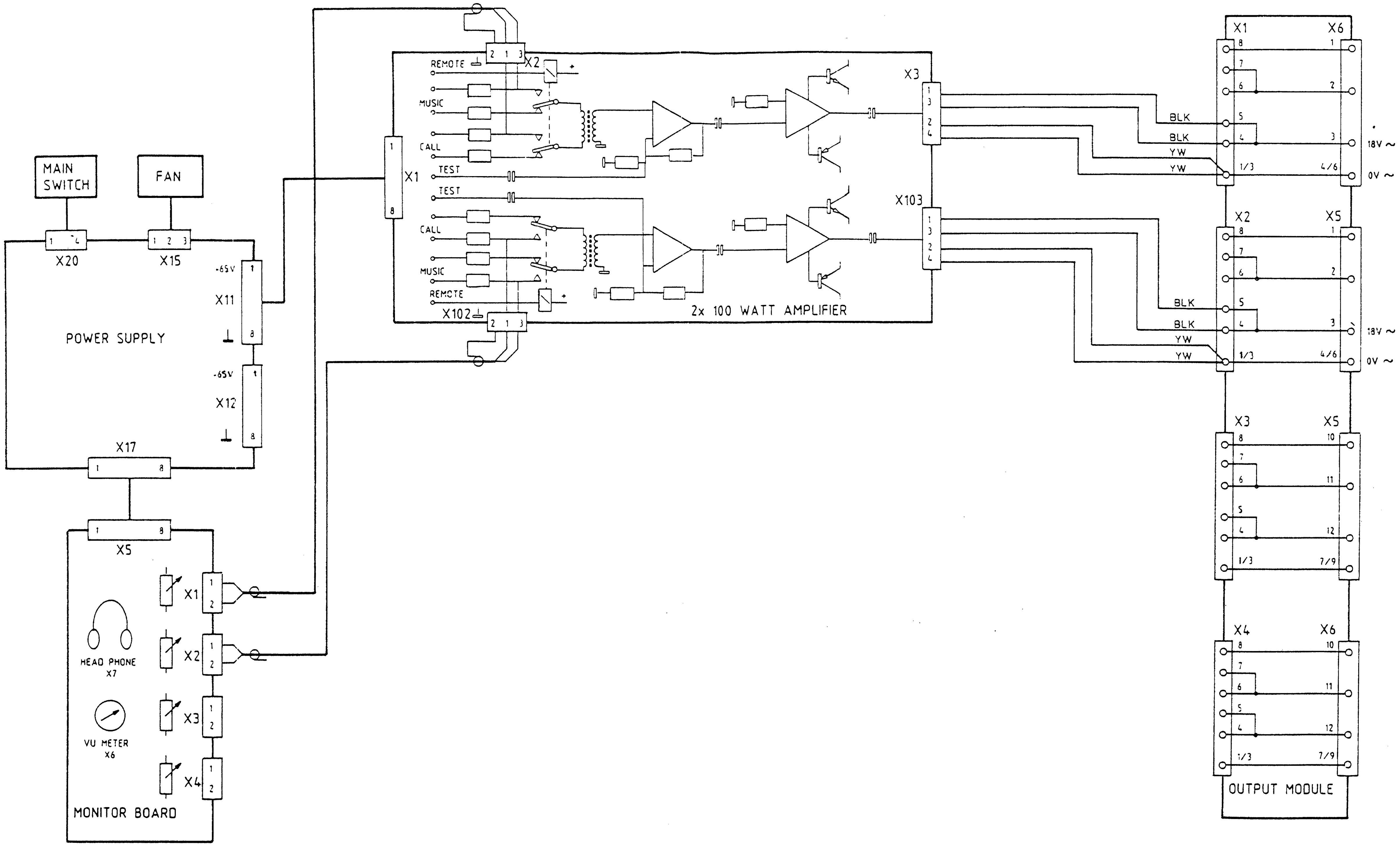


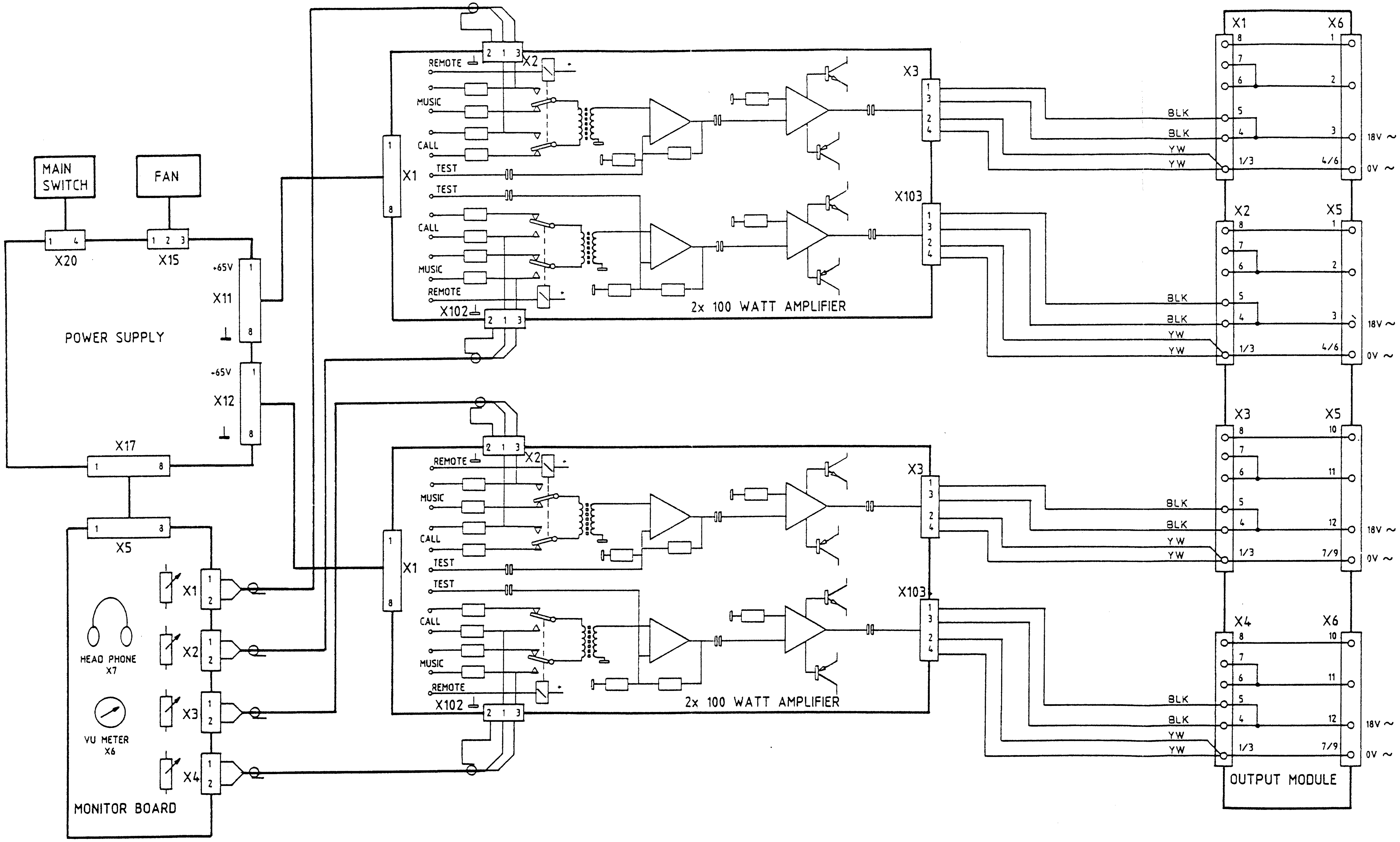

gl/gn
gl/gn
II
I
S2

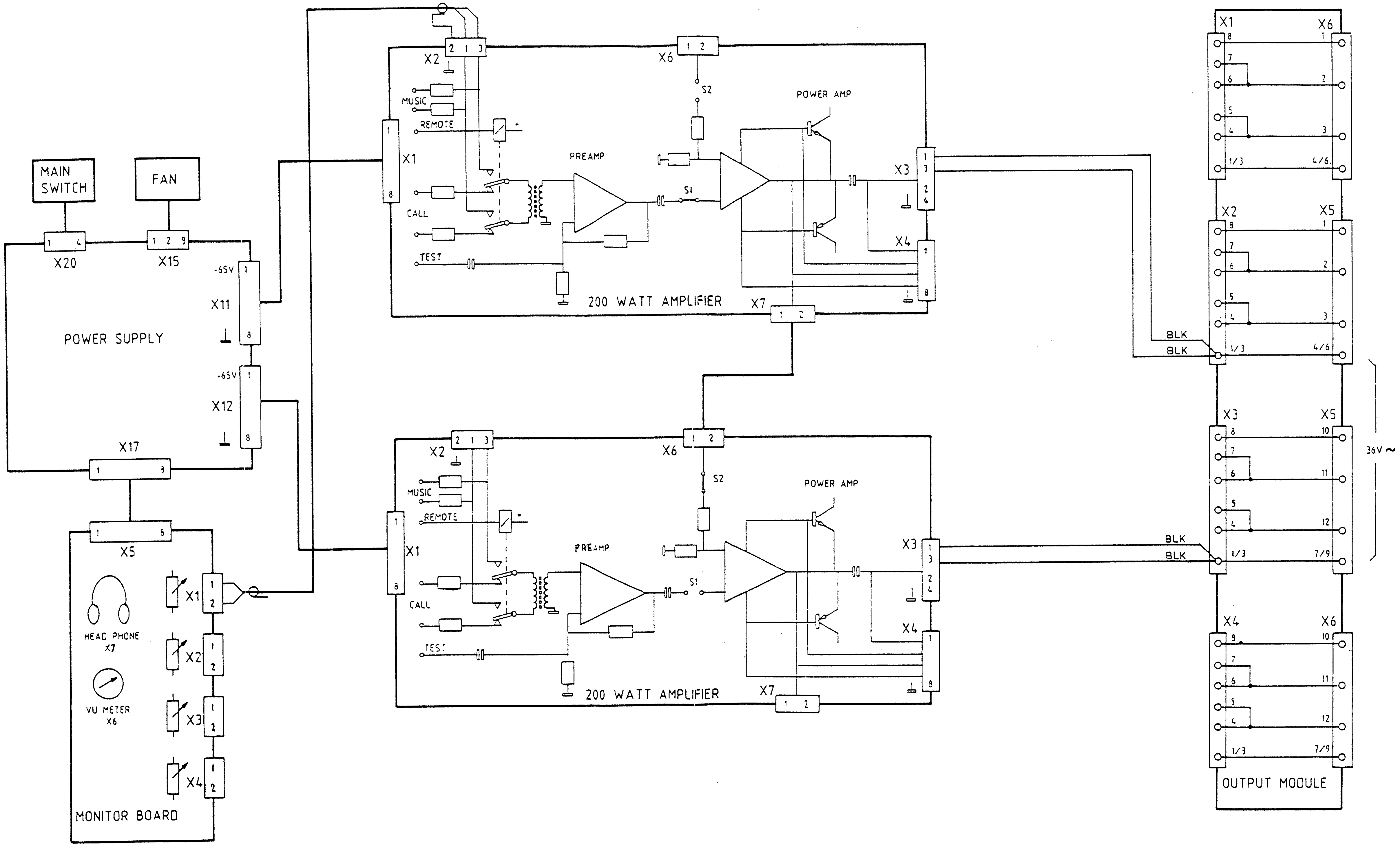
only valid
for LBB 1335/ --
pos. 12

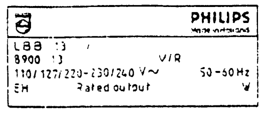

SQ 45
PHILIPS

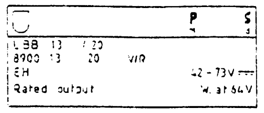


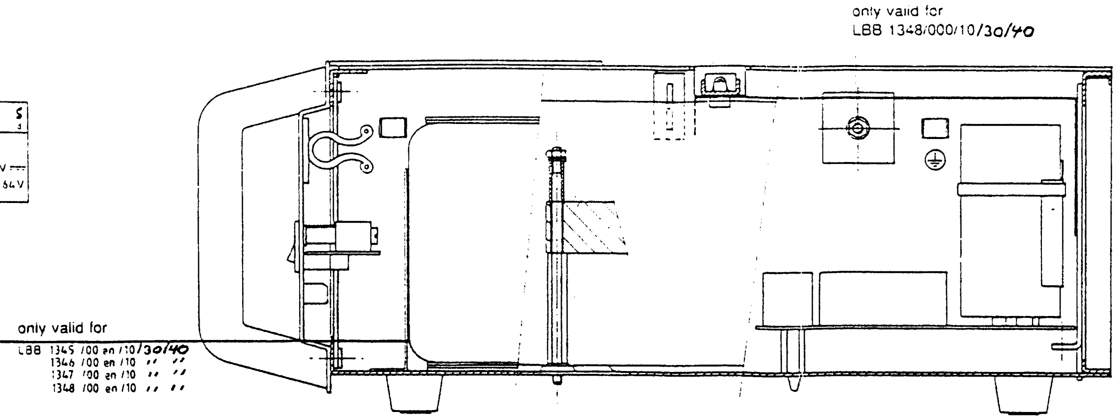

MAIN SWITCH
FAN
X20
X15
POWER SUPPLY
-65V
X11
X12
X17
X5
X1
X2
X3
X4
HEAD PHONE X7
VU METER X6
MONITOR BOARD
REMOTE
MUSIC
CALL
TEST
X2
X1
X102
X3
X103
2x 100 WATT AMPLIFIER
BLK
YW
X1
X6
X2
X5
X3
X5
X4
X6
18V ~
0V ~
OUTPUT MODULE

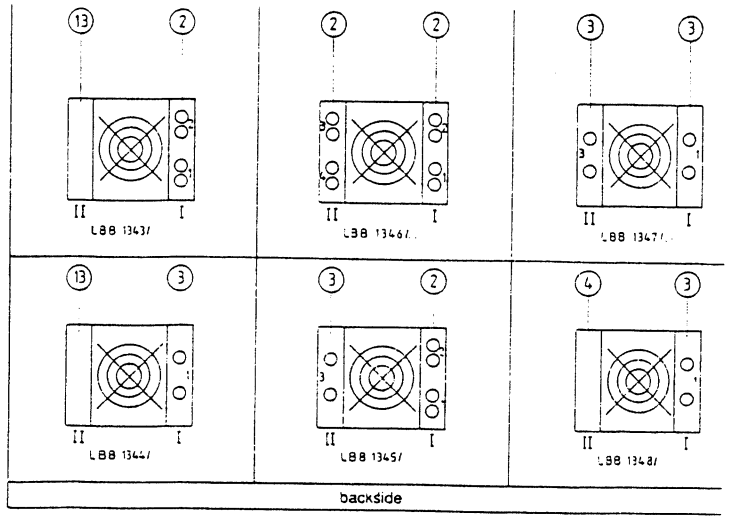

MAIN SWITCH
FAN
X20
X15
POWER SUPPLY
+65V
X11
-65V
X12
X17
X5
MONITOR BOARD
HEAD PHONE X7
VU METER X6
X1
X2
X3
X4
REMOTE
MUSIC
CALL
TEST
X102
X103
2x 100 WATT AMPLIFIER
BLK
YW
18V ~
0V ~
X6
X5
OUTPUT MODULE

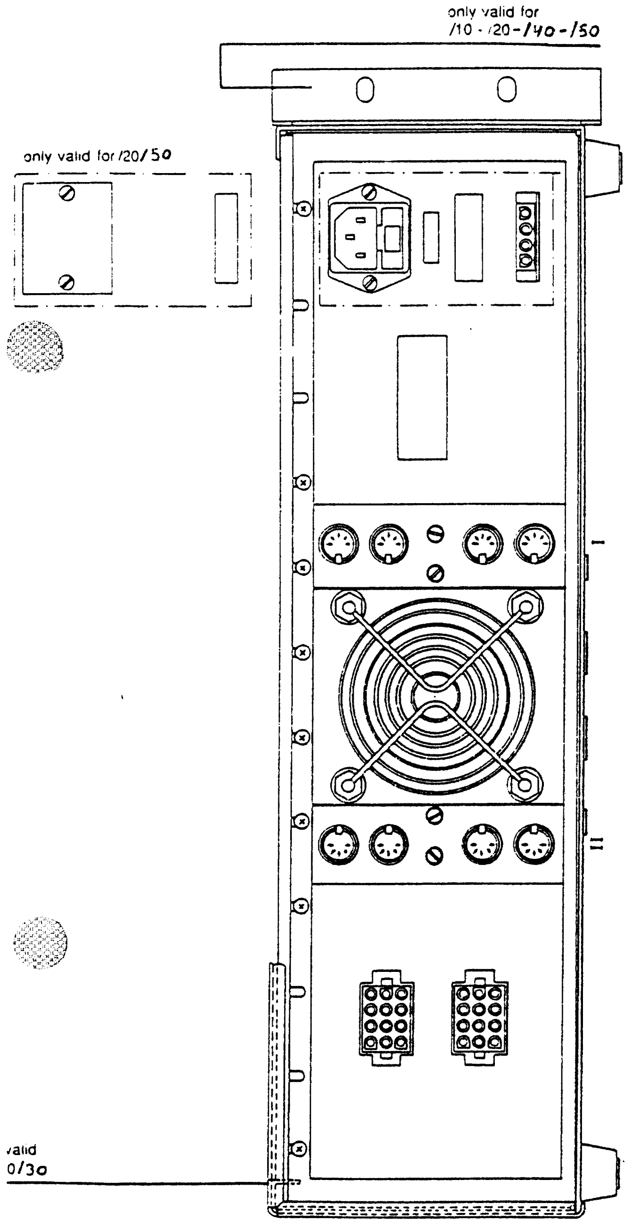

MAIN SWITCH
FAN
X20
X15
POWER SUPPLY
-65V
X11
X12
X17
X5
X1
X2
X3
X4
HEAD PHONE X7
VU METER X6
MONITOR BOARD
MUSIC
REMOTE
CALL
TEST
PREAMP
S1
S2
POWER AMP
X6
X7
200 WATT AMPLIFIER
BLK
BLK
36V ~
OUTPUT MODULE
X5
X6
1/3
4/6
7/9

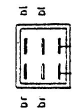

PHILIPS
LBB 13 /
8900 13 V/R
110/127/220-230/240 V~ 50-60Hz
EH Rated output W

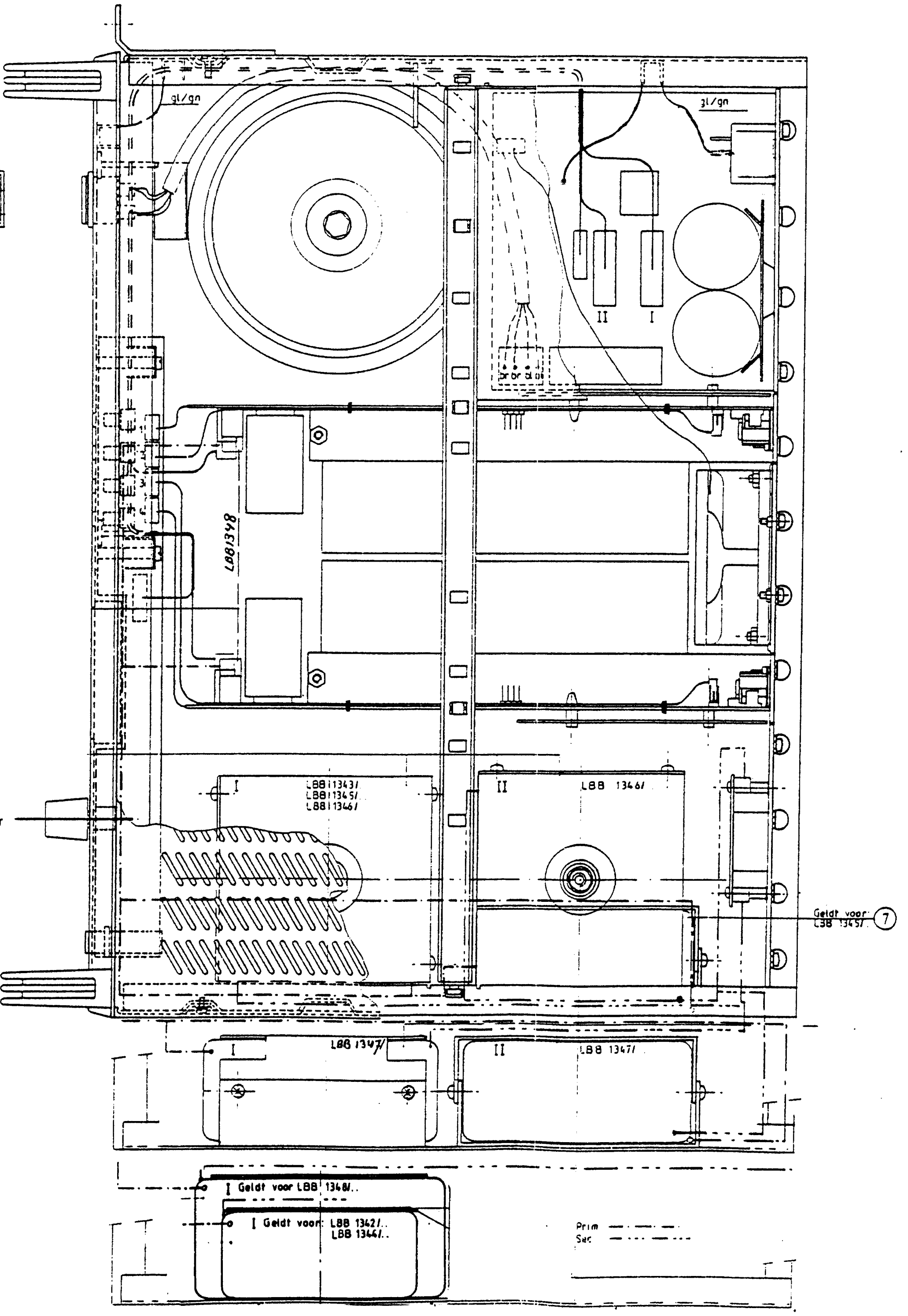

P S
LBB 13 /20
8900 13 20 V/R
EH 42 - 73V
Rated output W. at 64V

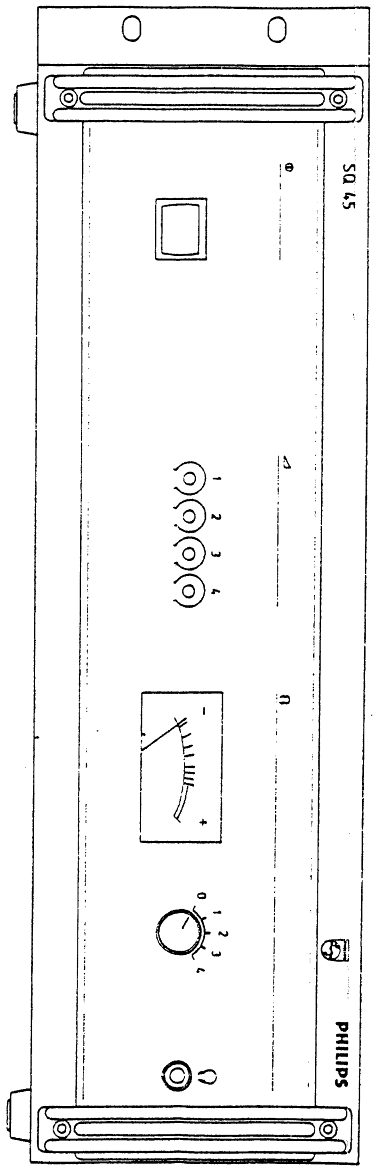

only valid for
LBB 1348/000/10/30/40
only valid for
LBB 1345 /00 en /10/30/40
1346 /00 en /10 " "
1347 /00 en /10 " "
1348 /00 en /10 " "

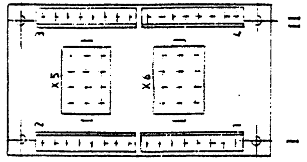

13
2
II
I
LBB 1343/
2
2
II
I
LBB 1346/..
3
3
II
I
LBB 1347/..
13
3
II
I
LBB 1344/
3
2
II
I
LBB 1345/
4
3
II
I
LBB 1348/
backside

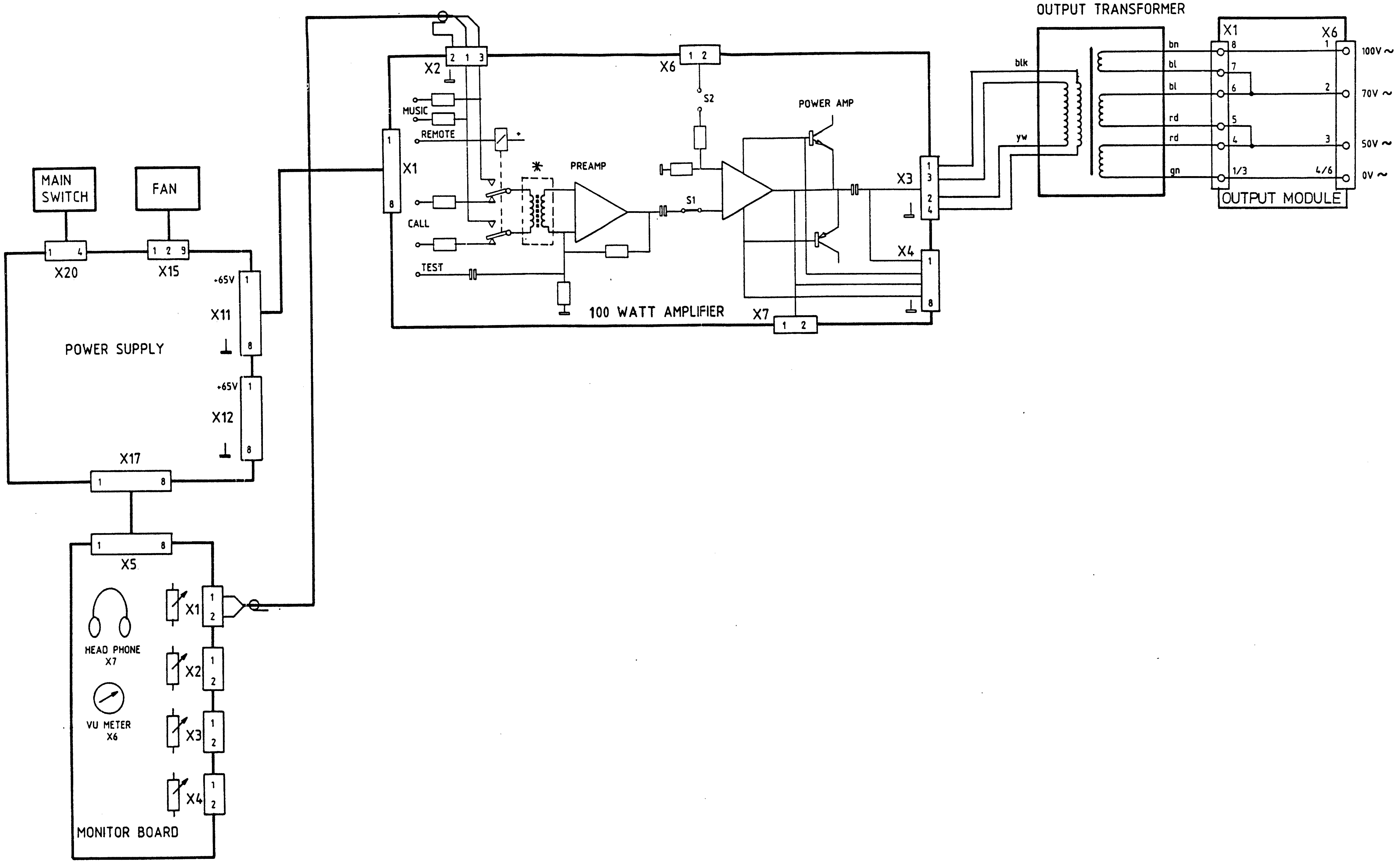

only valid for
/10 - /20-/40-/50
only valid for /20/50
I
II
valid
0/30

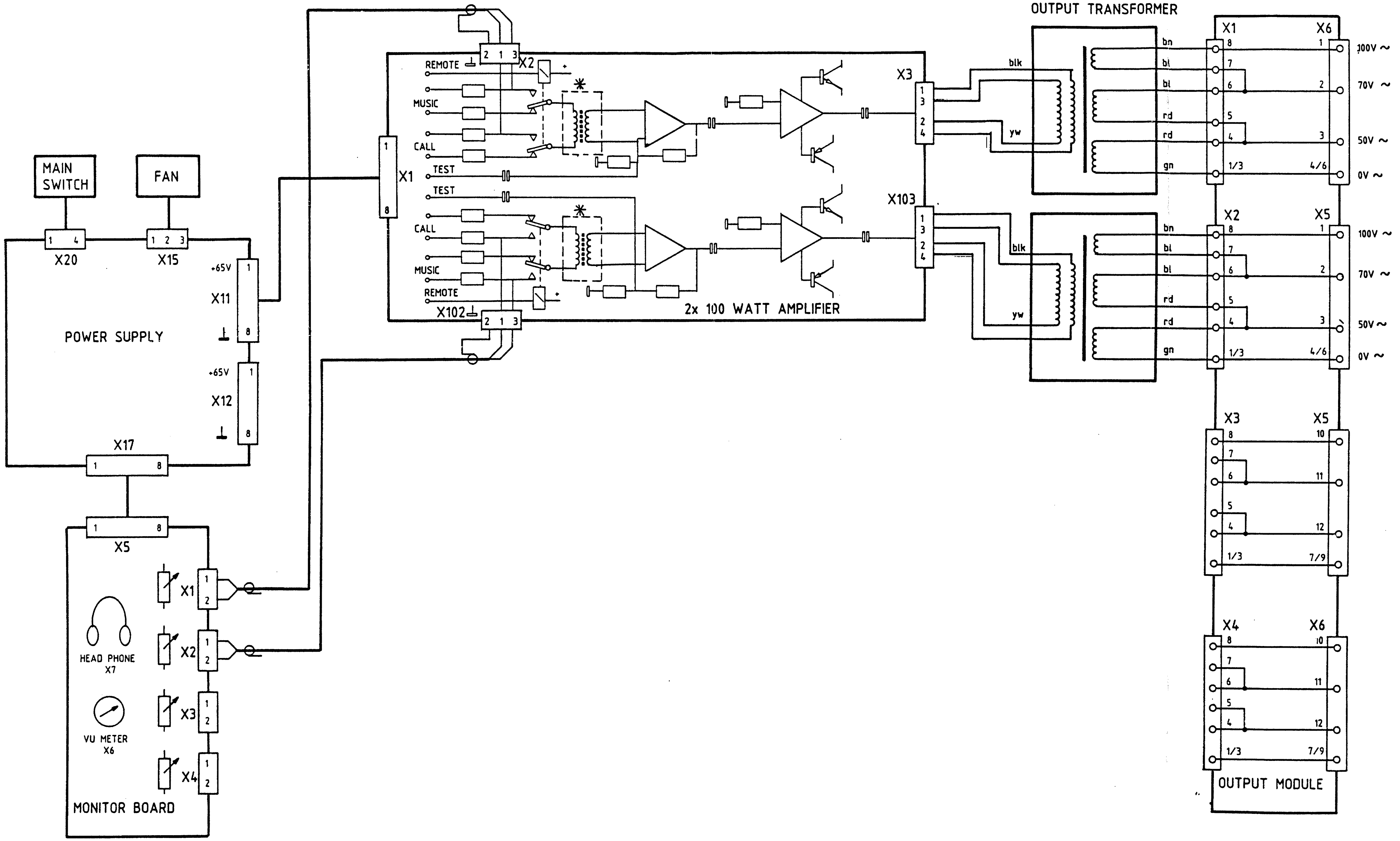

bl
bl
br
br


gl/gn
gl/gn
II
I
LBB1348
only valid for
LBB 1348
I
LBB1343/
LBB1345/
LBB1346/
II
LBB 1346/
Geldt voor
LBB 1345/
7
I
LBB 1347/
II
LBB 1347/
I Geldt voor LBB 1348/..
I Geldt voor: LBB 1342/..
LBB 1344/..
Prim
Sec


SQ 45
PHILIPS

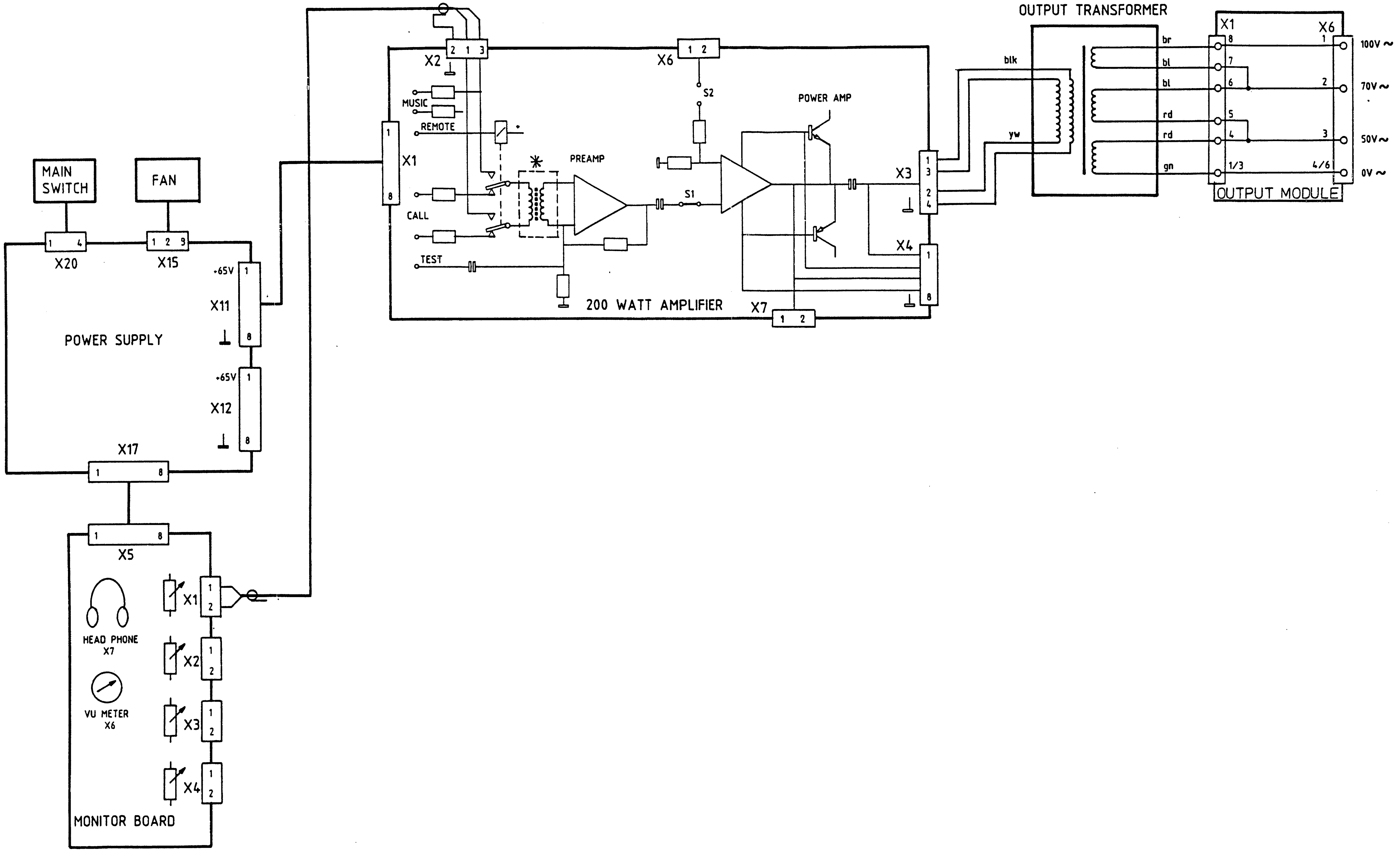

II
I
X5
X6

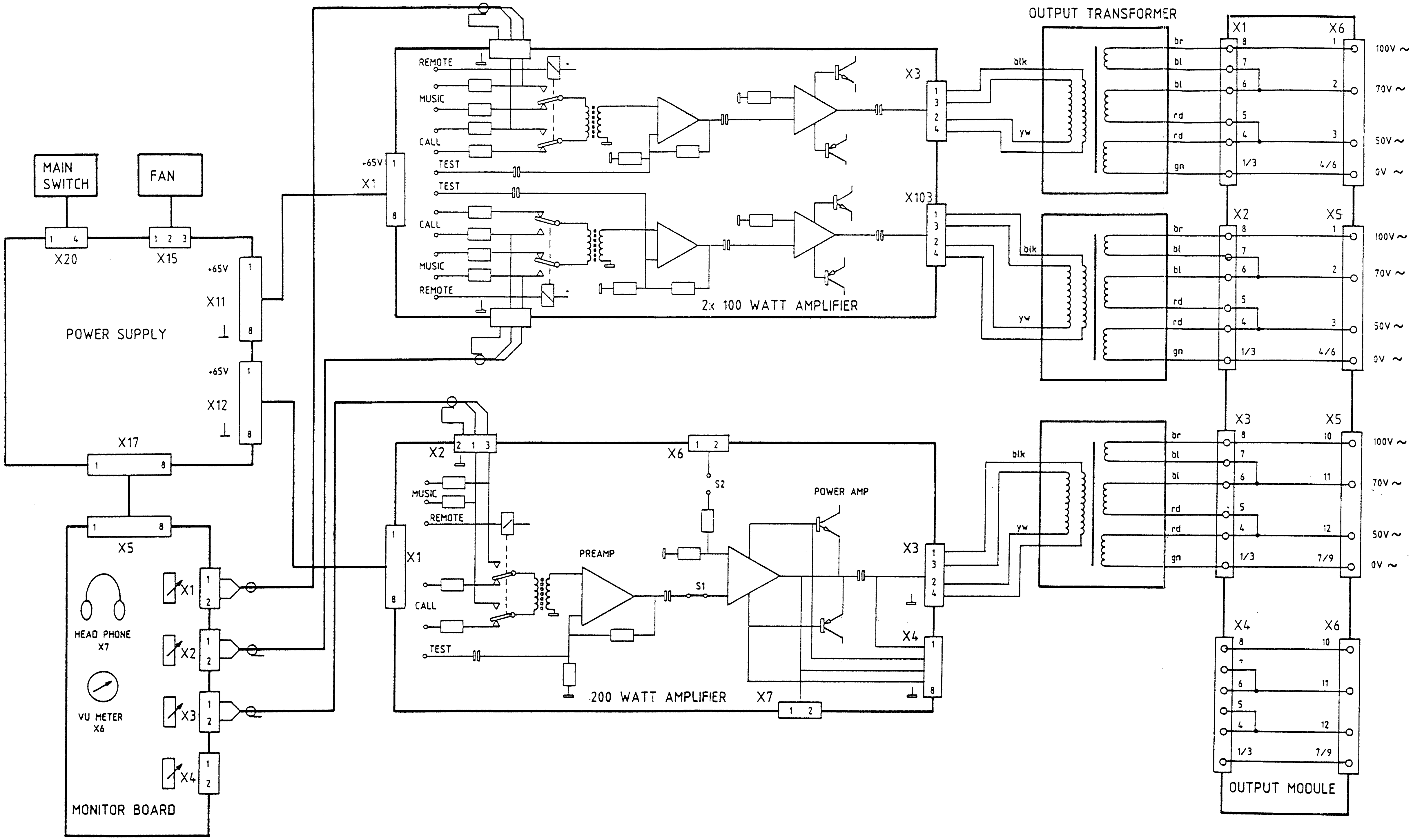

OUTPUT TRANSFORMER
X1
X6
bn
bl
bl
rd
rd
gn
8
7
6
5
4
1/3
1
2
3
4/6
100V ~
70V ~
50V ~
0V ~
OUTPUT MODULE
blk
yw
X2
2 1 3
X6
1 2
S2
POWER AMP
MUSIC
REMOTE
X1
1
8
PREAMP
S1
X3
1
3
2
4
X4
1
8
CALL
TEST
100 WATT AMPLIFIER
X7
1 2
MAIN SWITCH
FAN
X20
X15
1 2 3
+65V
X11
POWER SUPPLY
+65V
X12
X17
X5
HEAD PHONE
X7
VU METER
X6
X1
X2
X3
X4
MONITOR BOARD

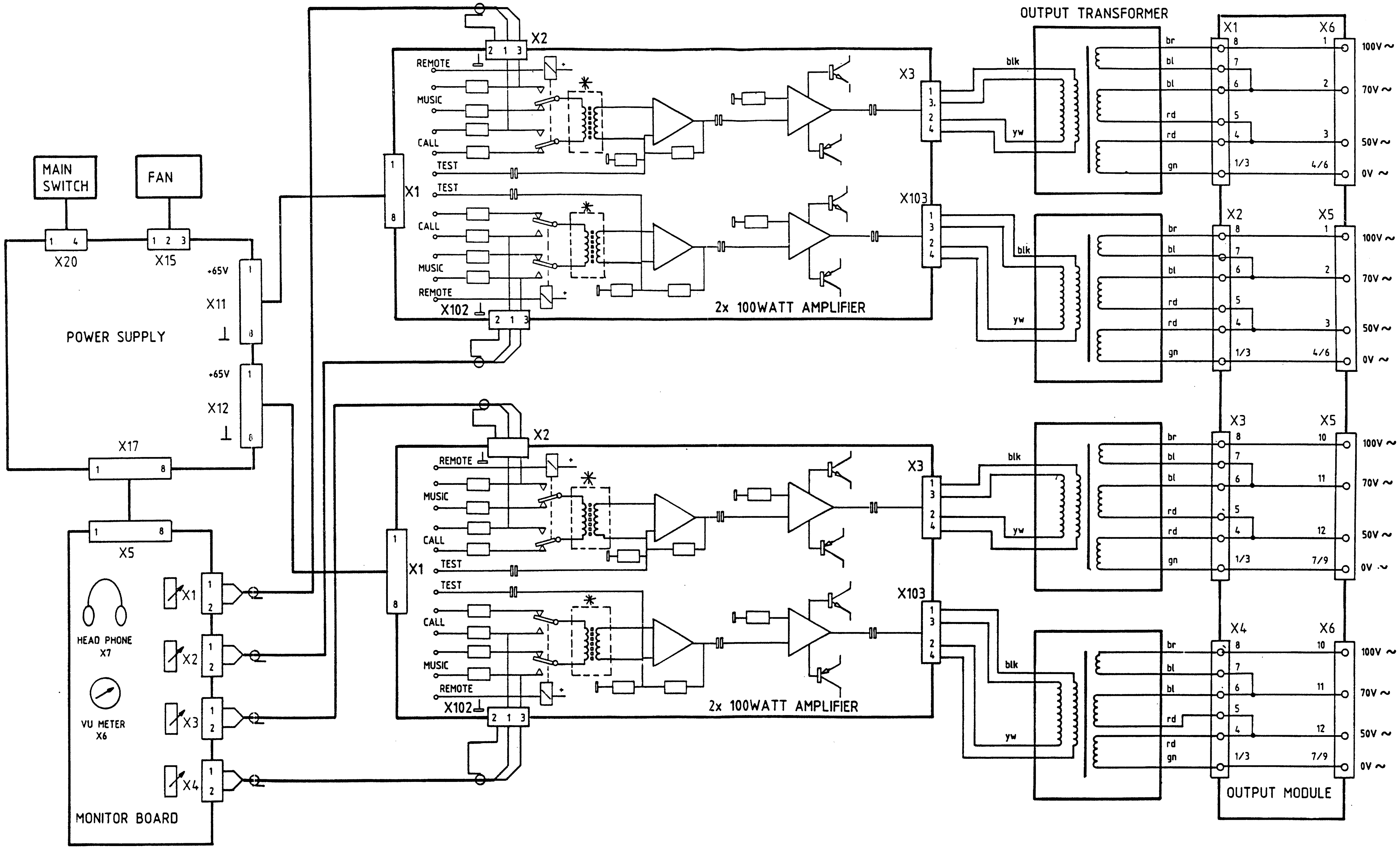

OUTPUT TRANSFORMER
MAIN SWITCH
FAN
X20
X15
POWER SUPPLY
+65V
X11
X12
X17
X5
HEAD PHONE X7
VU METER X6
MONITOR BOARD
X1
X2
X3
X4
REMOTE
MUSIC
CALL
TEST
X102
X103
2x 100 WATT AMPLIFIER
blk
yw
bn
bl
rd
gn
X6
100V ~
70V ~
50V ~
0V ~
1/3
4/6
7/9
OUTPUT MODULE

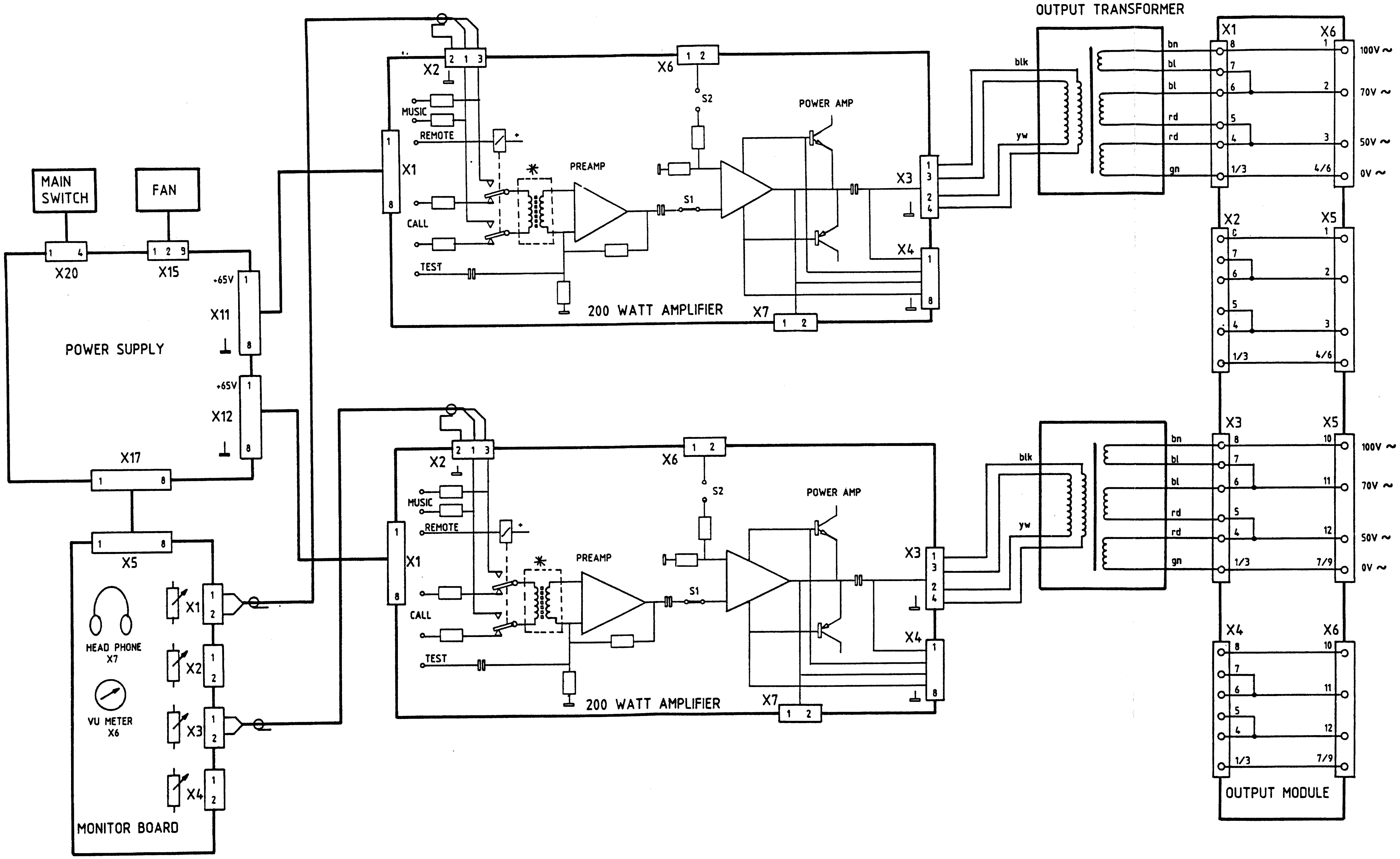
LBB1343/xx

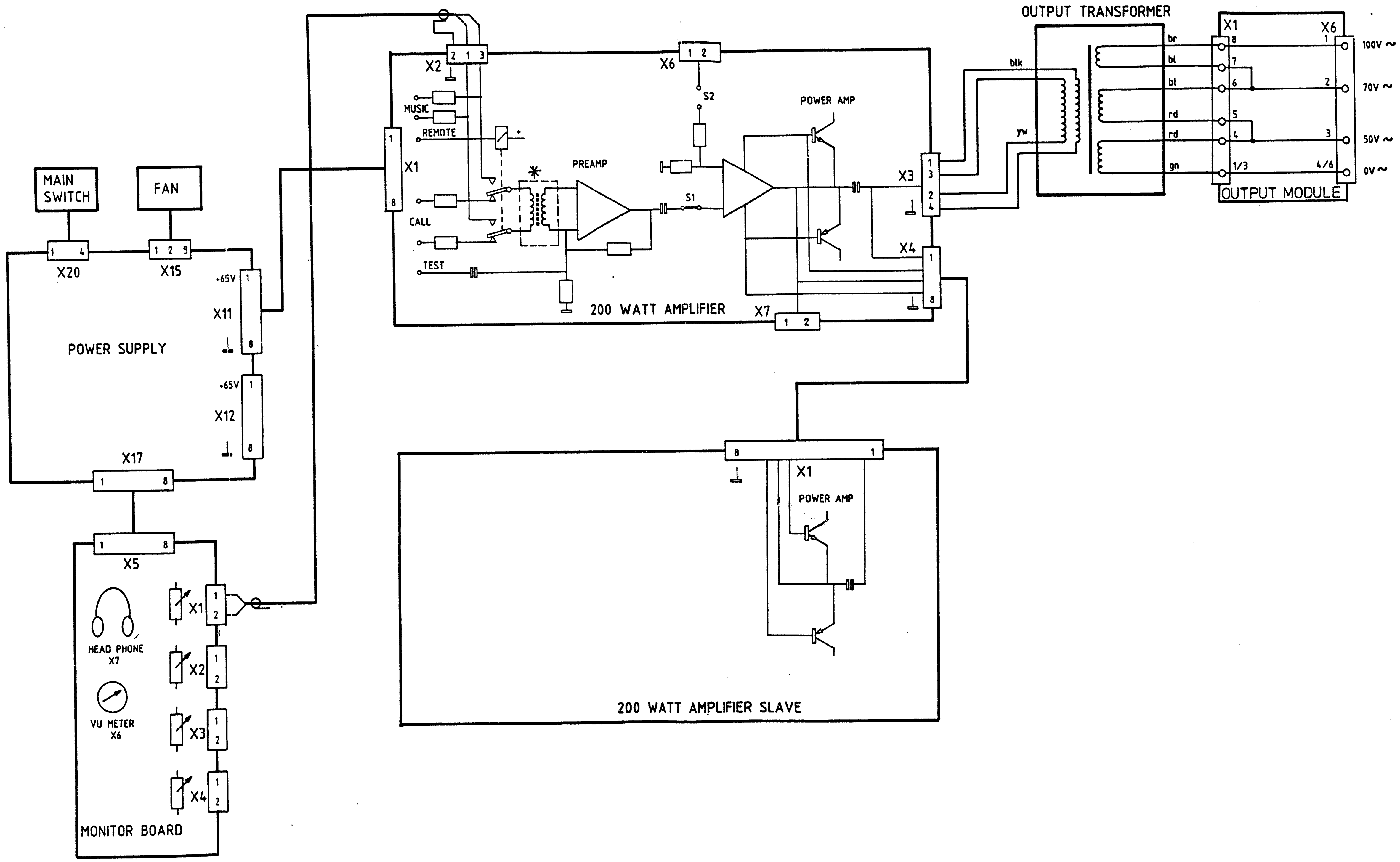
ELECTRICAL DRAWING

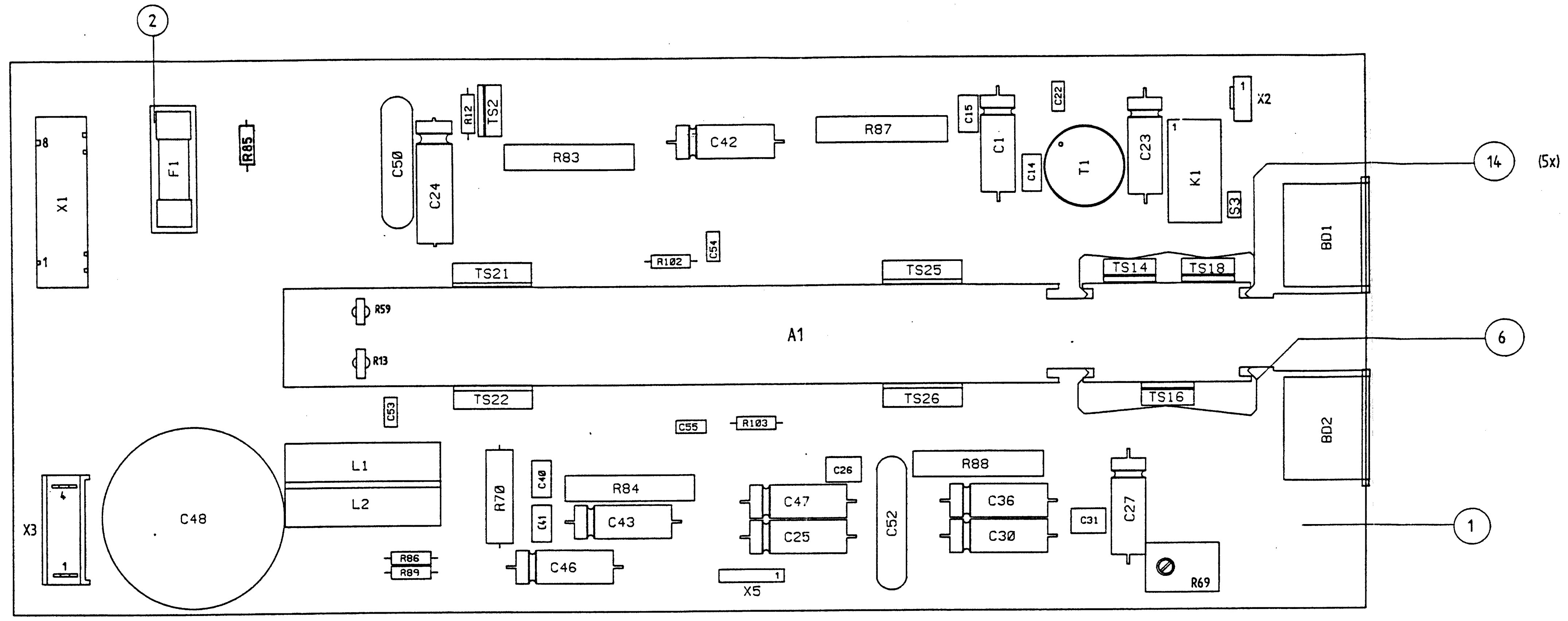

MAIN SWITCH
FAN
X20
1 4
X15
1 2 3
POWER SUPPLY
+65V
X11
1 8
+65V
X12
1 8
X17
1 8
X5
1 8
HEAD PHONE X7
VU METER X6
X1
X2
X3
X4
1 2
MONITOR BOARD
X2
2 1 3
X6
1 2
S2
MUSIC
REMOTE
X1
1 8
CALL
TEST
PREAMP
S1
POWER AMP
X3
1 3 2 4
X4
1 8
200 WATT AMPLIFIER
X7
1 2
OUTPUT TRANSFORMER
blk
yw
br
bl
bl
rd
rd
gn
X1
8
7
6
5
4
1/3
X6
1
2
3
4/6
100V ~
70V ~
50V ~
0V ~
OUTPUT MODULE


OUTPUT TRANSFORMER
MAIN SWITCH
FAN
X20
X15
POWER SUPPLY
+65V
X11
X12
X17
X5
2x 100 WATT AMPLIFIER
REMOTE
MUSIC
CALL
TEST
X1
X3
X103
blk
yw
br
bl
rd
gn
X6
X2
100V ~
70V ~
50V ~
0V ~
200 WATT AMPLIFIER
PREAMP
POWER AMP
S1
S2
X4
X7
HEAD PHONE X7
VU METER X6
MONITOR BOARD
OUTPUT MODULE


MAIN SWITCH
FAN
X20
X15
POWER SUPPLY
+65V
X11
X12
X17
X5
HEAD PHONE X7
VU METER X6
MONITOR BOARD
X1
X2
X3
X4
X102
X103
REMOTE
MUSIC
CALL
TEST
2x 100WATT AMPLIFIER
OUTPUT TRANSFORMER
blk
yw
br
bl
rd
gn
X6
100V ~
70V ~
50V ~
0V ~
OUTPUT MODULE

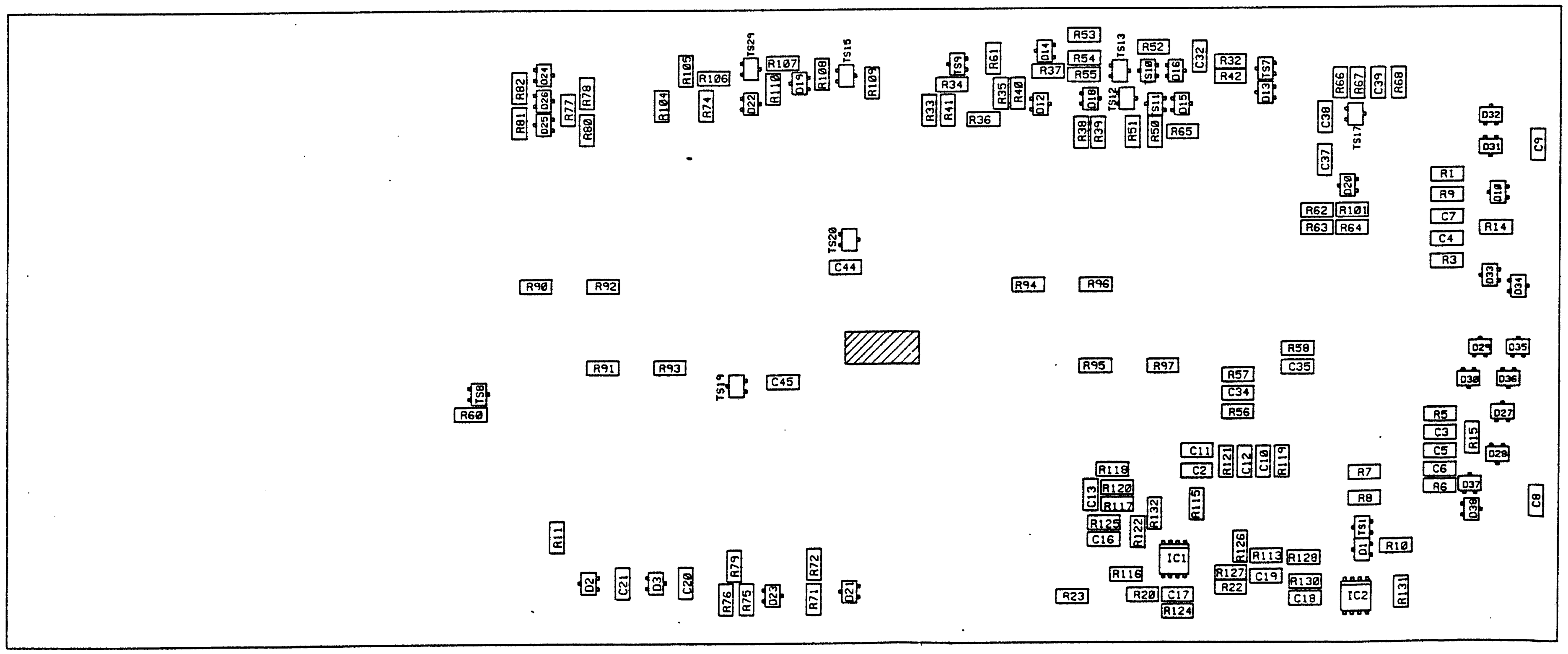

OUTPUT TRANSFORMER
MAIN SWITCH
FAN
X20
X15
POWER SUPPLY
+65V
X11
X12
X17
X5
HEAD PHONE X7
VU METER X6
MONITOR BOARD
X1
X2
X3
X4
MUSIC
REMOTE
CALL
TEST
PREAMP
S1
S2
X6
POWER AMP
X7
200 WATT AMPLIFIER
blk
yw
bn
bl
rd
gn
100V ~
70V ~
50V ~
0V ~
1/3
4/6
7/9
OUTPUT MODULE


OUTPUT TRANSFORMER
OUTPUT MODULE
X1
X6
br
bl
bl
rd
rd
gn
blk
yw
8
7
6
5
4
1/3
1
2
3
4/6
100V ~
70V ~
50V ~
0V ~
X2
2 1 3
X6
1 2
S2
S1
MUSIC
REMOTE
CALL
TEST
PREAMP
POWER AMP
X1
X3
X4
X7
200 WATT AMPLIFIER
MAIN SWITCH
FAN
X20
X15
X11
X12
X17
+65V
POWER SUPPLY
X5
HEAD PHONE
X7
VU METER
X6
X1
X2
X3
X4
MONITOR BOARD
X1
POWER AMP
200 WATT AMPLIFIER SLAVE


2
X1
8
1
F1
R85
C50
C24
R12
TS2
R83
C42
R87
C15
C1
C22
C14
T1
C23
K1
X2
S3
14
(5x)
BD1
TS21
R102
C54
TS25
TS14
TS18
A1
R59
R13
6
TS22
TS26
TS16
C53
C55
R103
BD2
X3
C48
L1
L2
R70
C40
C41
R84
C43
C46
R86
R89
C47
C25
C26
X5
C52
R88
C36
C30
C31
C27
R69
1

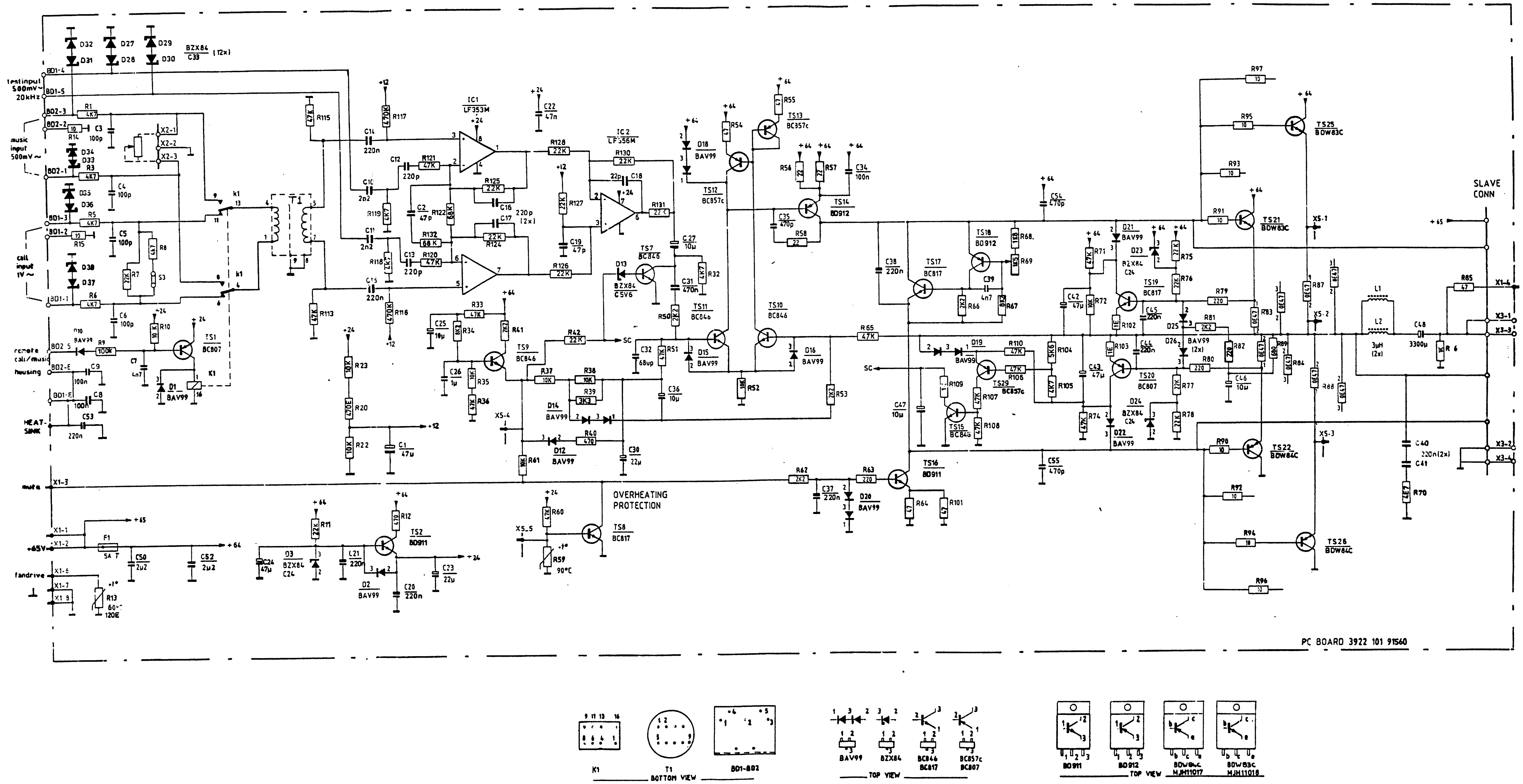
TOP VIEW

3922 101 91560 PRENTPANEEL / PRINTED BOARD


R82
R81
D24
D26
D25
R77
R78
R80
R105
R104
R106
R74
TS24
D22
R107
R110
D19
R108
TS15
R109
R53
R61
R54
R37
R55
D14
R33
R41
R34
R36
R35
R40
D12
TS13
R52
D16
R32
R42
C32
TS12
D18
R38
R39
R51
R50
D15
R65
D13
R66
R67
C39
R68
C38
C37
TS17
D20
D32
D31
C9
R1
R9
C7
C4
R3
D10
R14
R62
R101
R63
R64
D33
D34
TS20
C44
R90
R92
R94
R96
R91
R93
TS19
C45
R95
R97
R59
C35
R57
C34
R56
D29
D35
D30
D36
D27
TS8
R60
R5
C3
C5
C6
R6
R15
D28
D37
D38
C8
C11
C2
R121
C12
C10
R119
R118
R120
R117
C13
R125
C16
R122
R132
R115
R7
R8
TS1
D1
R10
R11
IC1
R126
R113
R128
R116
R127
C19
R130
R22
C18
R20
C17
R124
R23
IC2
R131
D2
C21
D3
C20
R76
R79
R75
D23
R72
R71
D21

BOTTOM VIEW

1 x 100W AMPLIFIER MODULE
PCB COMPONENT LAYOUT


testinput 500mV~ 20kHz
music input 500mV ~
call input 1V ~
remote call/music
housing
HEAT-SINK
mute
+65V
fandrive
BD1-4
BD1-5
BD2-3
BD2-2
BD2-1
BD1-3
BD1-2
BD1-1
BD2-5
BD2-E
BD1-E
X1-3
X1-1
X1-2
X1-6
X1-7
X1 9
X2-1
X2-2
X2-3
D32
D31
D27
D28
D29
D30
BZX84 C33 (12x)
D34
D33
D35
D36
D38
D37
R1 4K7
R14 10
C3 100p
R3 4K7
C4 100p
R5 4K7
R15 10
C5 100p
R8 4K7
R7 2K2
S3
R6 4K7
C6 100p
R9 100K
BAV99
C7 4n7
R10 10K
TS1 BC807
D1 BAV99
K1
k1
T1
C9 100n
C8 100n
C53 220n
F1 5A T
C50 2µ2
C52 2µ2
R13 60-- 120E
R115 47K
R117 470K
C14 220n
C10 2n2
C11 2n2
C15 220n
R119 4K7
R118 4K7
C12 220p
C13 220p
C2 47p
R121 47K
R120 47K
R122 68K
R132 68K
R113 47K
R116 470K
IC1 LF353M
+24
+12
R125 22K
R124 22K
C16 220p (2x)
C17
C22 47n
R128 22K
R126 22K
IC2 LF356M
R130 22K
22p C18
R127 22K
C19 47p
R131 22K
C27 10µ
R32 4K7
C31 470n
TS7 BC846
D13 BZX84 C5V6
R50 2K2
C25 10µ
R34 8K2
R33 47K
R41 2K2
+64
C26 1µ
R35 10K
R36 47K
TS9 BC846
R42 22K
SC
R37 10K
R38 10K
R39 3K3
D14 BAV99
R40 470
D12 BAV99
R61 10K
C30 22µ
X5-4
R23 10K
R20 470E
R22 10K
C1 47µ
C32 68µp
R51 47K
D15 BAV99
C36 10µ
TS11 BC846
OVERHEATING PROTECTION
R60 47K
TS8 BC817
X5-5
R59 90°C
R11 22K
C24 47µ
D3 BZX84 C24
C21 220n
D2 BAV99
R12 470
TS2 BD911
C20 220n
C23 22µ
+65
+64
D18 BAV99
R54 47
TS12 BC857c
R55 47
TS13 BC357c
R56 22
R57 22
C34 100n
C35 470p
R58 22
TS14 BD912
R52 10K
TS10 BC846
D16 BAV99
R53 2K2
R62 2K2
C37 220n
D20 BAV99
R63 220
TS16 BD911
R64 47
R101 47
C38 220n
TS17 BC817
R66 2K2
C39 4n7
R67 2K2
TS18 BD912
R68 1K8
R69 1K5
R65 47K
C47 10µ
D19 BAV99
R110 47K
R106 47K
TS29 BC857c
R109 1K
TS15 BC846
R107 47K
R108 47K
R104 5K6
R105 4K7
C54 470p
C55 470p
R71 47K
C42 47µ
R72 10K
R102 1E
D21 BAV99
D23 BZX84 C24
R75 22K
TS19 BC817
R76 22K
R79 220
C45 220n
D25 BAV99 (2x)
R81 2K2
D26
R103 1E
C44 220n
C43 47µ
TS20 BC807
R80 220
R82 220
R77 22K
C46 10µ
D24 BZX84 C24
R74 47K
D22 BAV99
R78 22K
R97 10
R95 10
TS25 BDW83C
R93 10
R91 10
TS21 BDW83C
R83 0E47
R89 0E47
R84
R87 0E47
R86 0E47
R88 0E47
X5-1
X5-2
X5-3
L1
L2 3µH (2x)
C48 3300µ
R 6 1K
R85 47
SLAVE CONN
+65
X1-4
X3-1
X3-3
output 18V ~
X3-2
X3-4
C40 220n(2x) C41
R70 4E7
R90 10
TS22 BDW84C
R92 10
R94 10
TS26 BDW84C
R96 10
PC BOARD 3922 101 91560
9 11 13 16
K1
T1
BD1-BD2
BOTTOM VIEW
BAV99
BZX84
BC846 BC817
BC857c BC807
TOP VIEW
BD911
BD912
BDW84C MJH11017
BDW83C MJH11018
TOP VIEW

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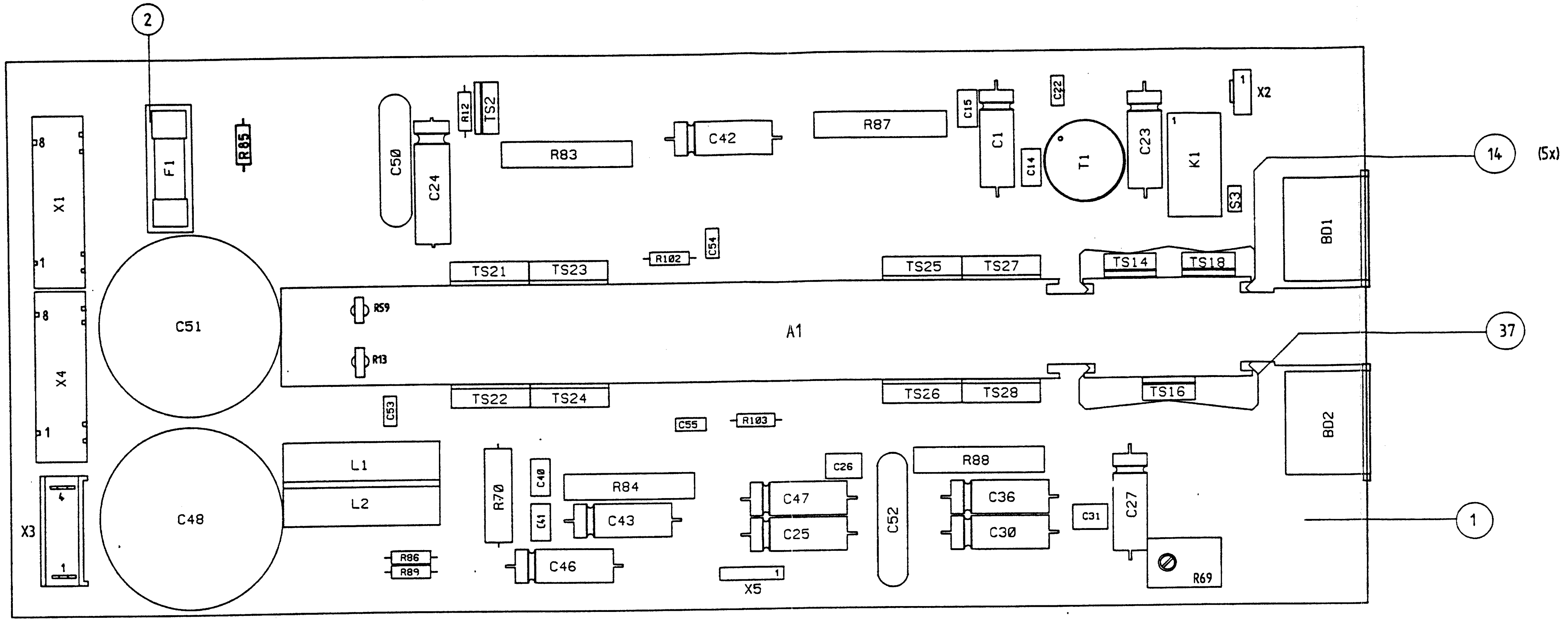
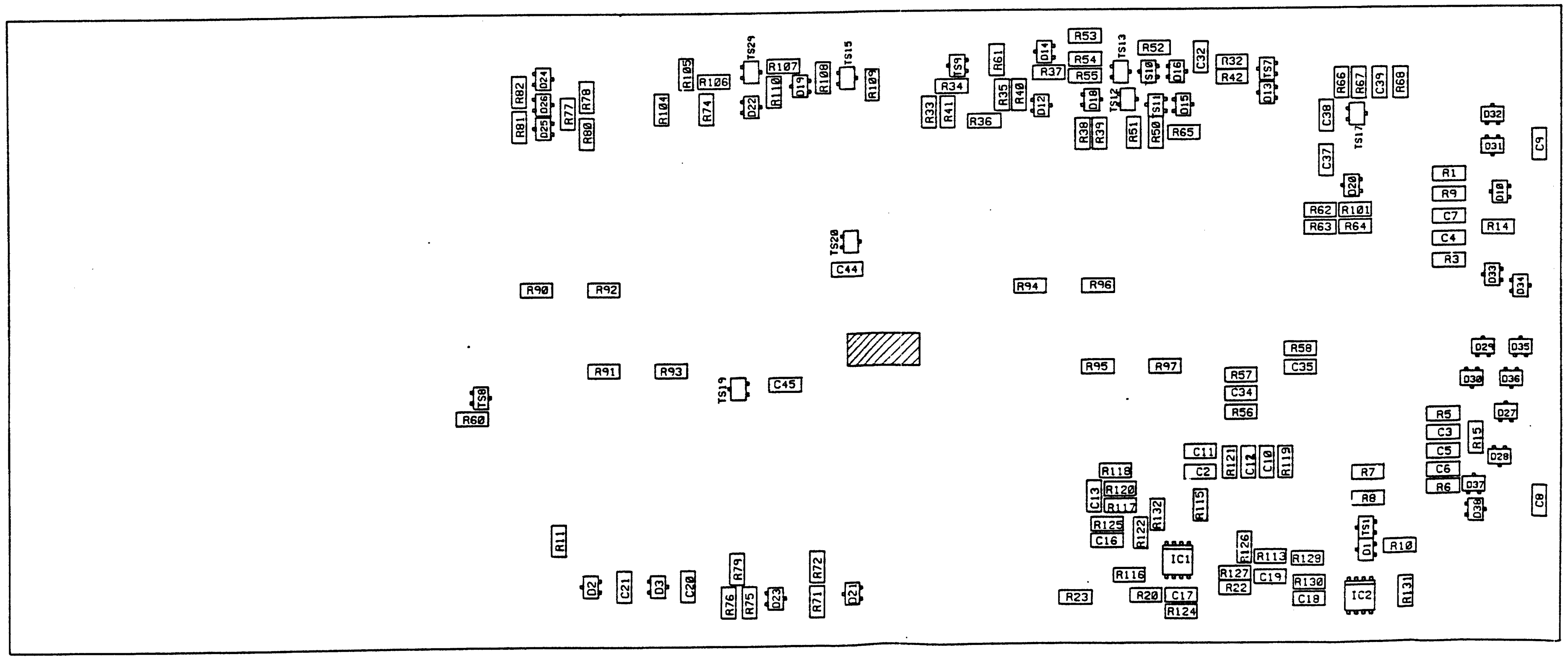
1 x 100W AMPLIFIER MODULE
CIRCUIT DIAGRAM


2
14
(5x)
37
1
F1
R85
X1
8
1
X4
X3
C51
C48
C50
C24
R12
TS2
R83
C42
R87
C15
C1
C22
T1
C14
C23
K1
X2
S3
BD1
BD2
R102
C54
TS21
TS23
TS25
TS27
TS14
TS18
A1
R59
R13
TS22
TS24
TS26
TS28
TS16
C53
C55
R103
L1
L2
R70
C40
C41
R84
C43
C46
R86
R89
C26
C47
C25
C52
X5
R88
C36
C30
C31
C27
R69

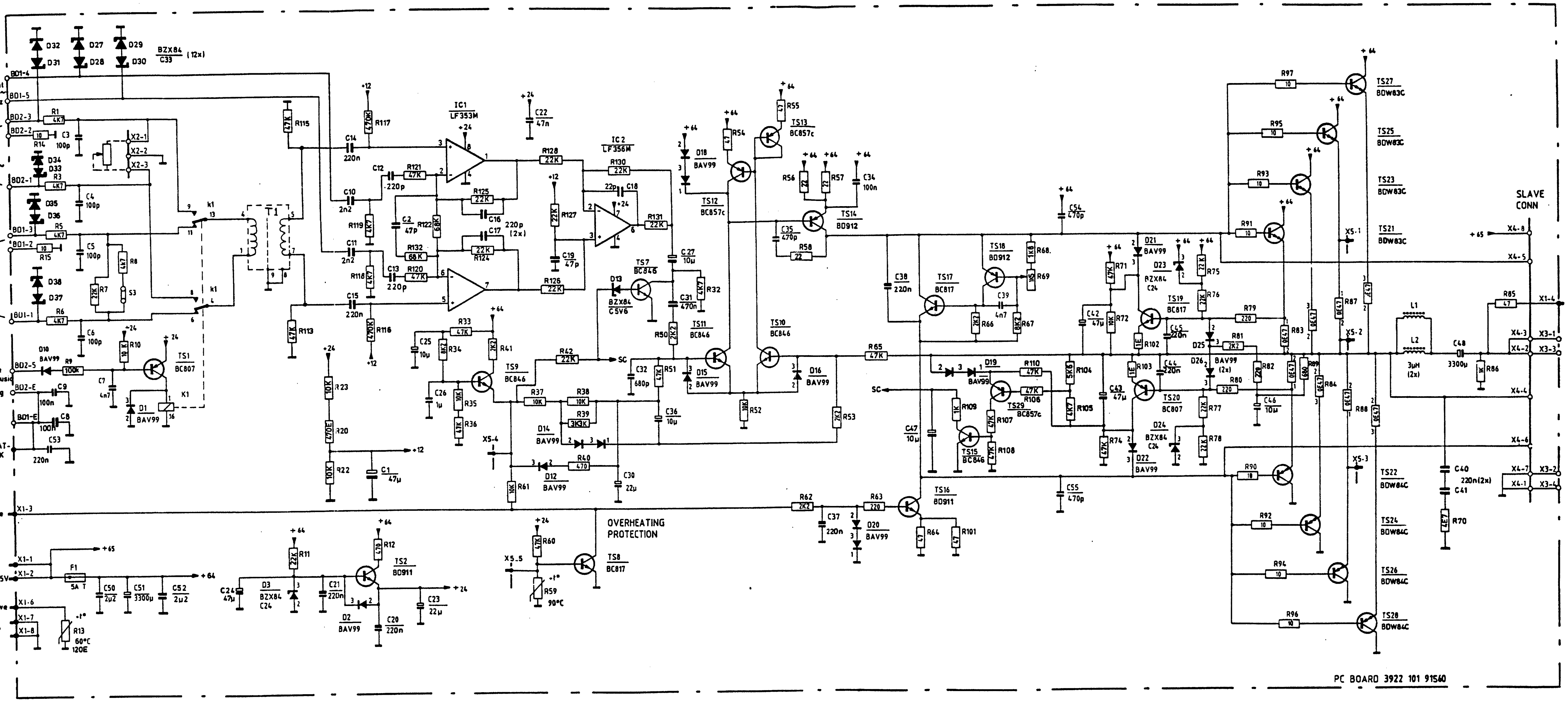
TOP VIEW

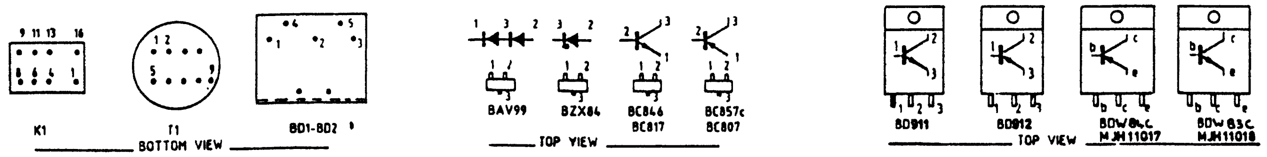
3922 101 91560 PRENTPANEEL / PRINTED BOARD


R82
R81
D24
D26
D25
R77
R78
R80
R104
R105
R74
R106
TS29
D22
R107
R110
R108
D19
TS15
R109
TS9
R34
R33
R41
R61
R35
R36
R40
D14
R37
D12
R53
R54
R55
TS13
R38
R39
D18
TS12
R52
D16
R51
R50
TS11
D15
R65
C32
R32
R42
TS7
D13
R66
R67
C39
R68
C38
TS17
C37
D32
D31
C9
R1
R9
C7
C4
R3
D10
R14
D20
R62
R101
R63
R64
D33
D34
TS20
C44
R90
R92
R94
R96
R91
R93
TS19
C45
R95
R97
R58
C35
R57
C34
R56
TS8
R60
D29
D35
D30
D36
D27
R5
C3
C5
C6
R6
R15
D28
D37
D38
C8
C11
C2
R121
C12
C10
R119
R118
R120
C13
R117
R125
R132
R115
C16
R122
IC1
R116
R20
C17
R124
R23
R126
R113
R129
R127
C19
R22
R130
C18
IC2
R7
R8
TS1
D1
R10
R131
R11
D2
C21
D3
C20
R79
R76
R75
D23
R72
R71
D21

BOTTOM VIEW

1 x 200W AMPLIFIER MODULE
PCB COMPONENT LAYOUT


testinput 500mV~ 20kHz
music input 500mV~
call input 1V~
remote call/music
housing
HEAT-SINK
mute
fandrive
+65V
BZX84 C33 (12x)
IC1 LF353M
IC2 LF356M
TS1 BC807
TS2 BD911
TS7 BC846
TS8 BC817
TS9 BC846
TS10 BC846
TS11 BC846
TS12 BC857c
TS13 BC857c
TS14 BD912
TS15 BC846
TS16 BD911
TS17 BC817
TS18 BD912
TS19 BC817
TS20 BC807
TS29 BC857c
TS21 BDW83C
TS23 BDW83C
TS25 BDW83C
TS27 BDW83C
TS22 BDW84C
TS24 BDW84C
TS26 BDW84C
TS28 BDW84C
OVERHEATING PROTECTION
R59 90°C
R13 60°C 120E
F1 5A T
L1
L2 3µH (2x)
C48 3300µ
SLAVE CONN
output 18V~
K1
T1
PC BOARD 3922 101 91560


K1
T1
BOTTOM VIEW
BD1-BD2
BAV99
BZX84
BC846 BC817
BC857c BC807
TOP VIEW
BD911
BD912
BDW84C MJH11017
BDW83C MJH11018
TOP VIEW

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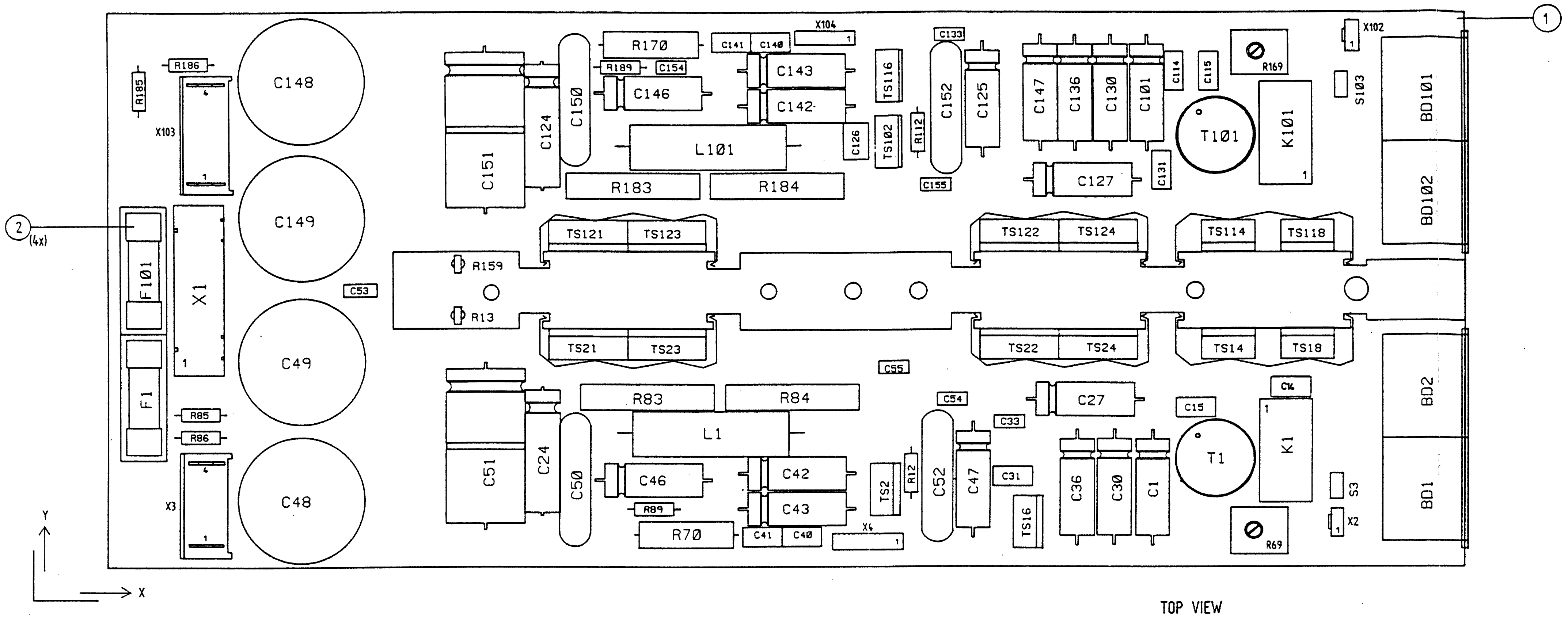
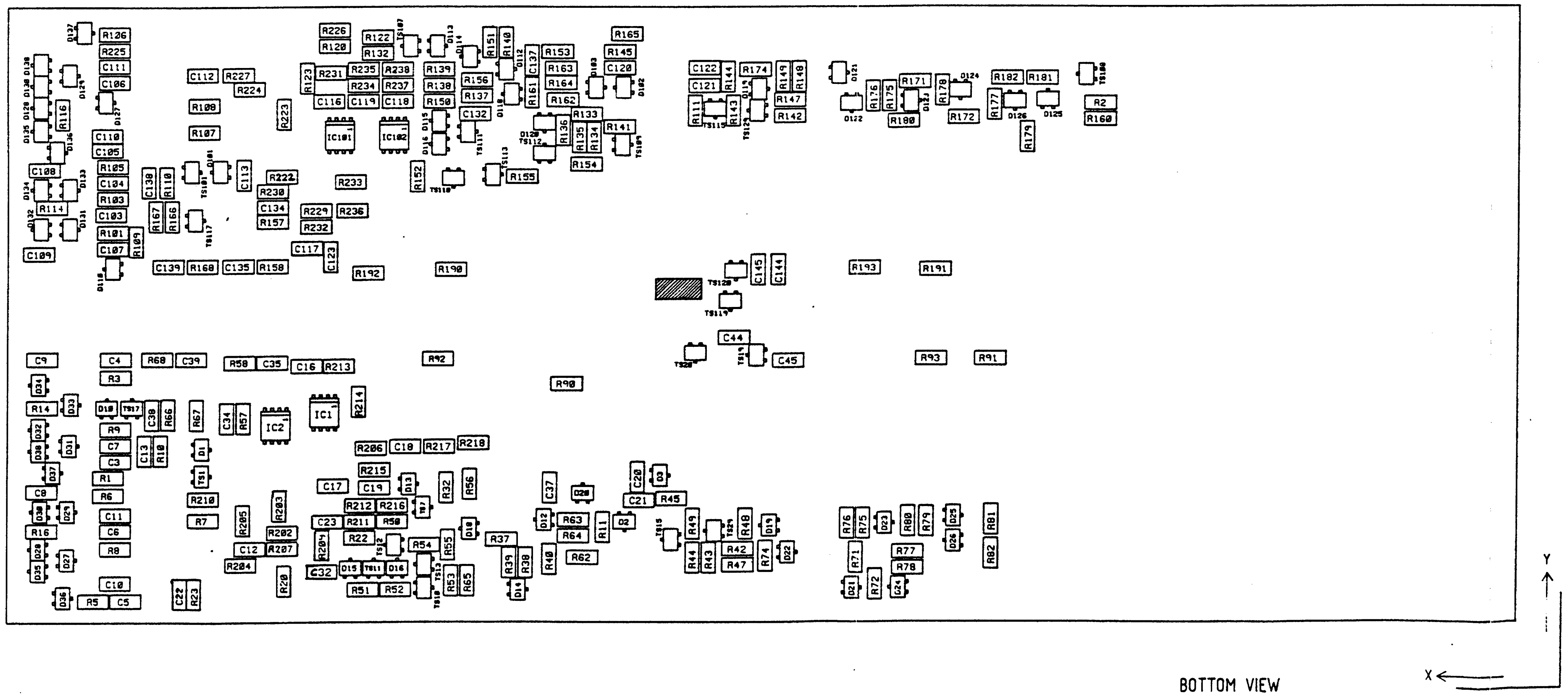
1 x 200W AMPLIFIER MODULE

CIRCUIT DIAGRAM

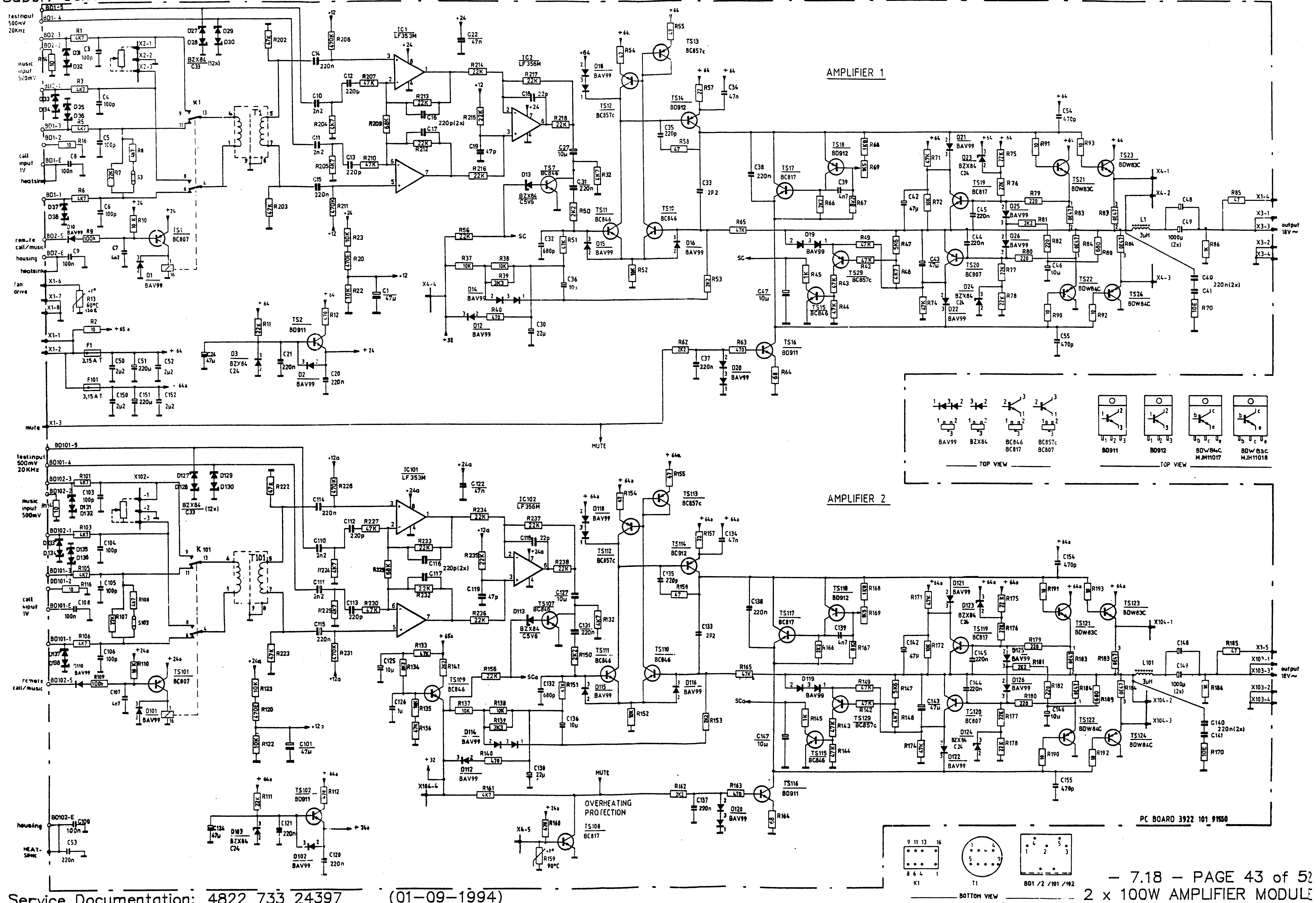

1
2
(4x)
R185
R186
X103
C148
C149
C49
C48
F101
X1
F1
R85
R86
X3
C53
C151
C124
C150
R170
R189
C154
C146
L101
R183
R184
C141
C140
X104
C143
C142
C126
TS116
TS102
R112
C133
C152
C125
C155
C147
C136
C130
C101
C114
C115
C127
C131
T101
R169
K101
X102
S103
BD101
BD102
TS121
TS123
TS122
TS124
TS114
TS118
R159
R13
TS21
TS23
TS22
TS24
TS14
TS18
C55
C51
C24
C50
R83
R84
L1
C46
R89
R70
C42
C43
C41
C40
X4
TS2
R12
C54
C52
C47
C33
C31
TS16
C27
C36
C30
C1
C15
C14
T1
K1
S3
X2
R69
BD2
BD1
Y
X

PC BOARD
PRENTPANEEL
3922 101 91550

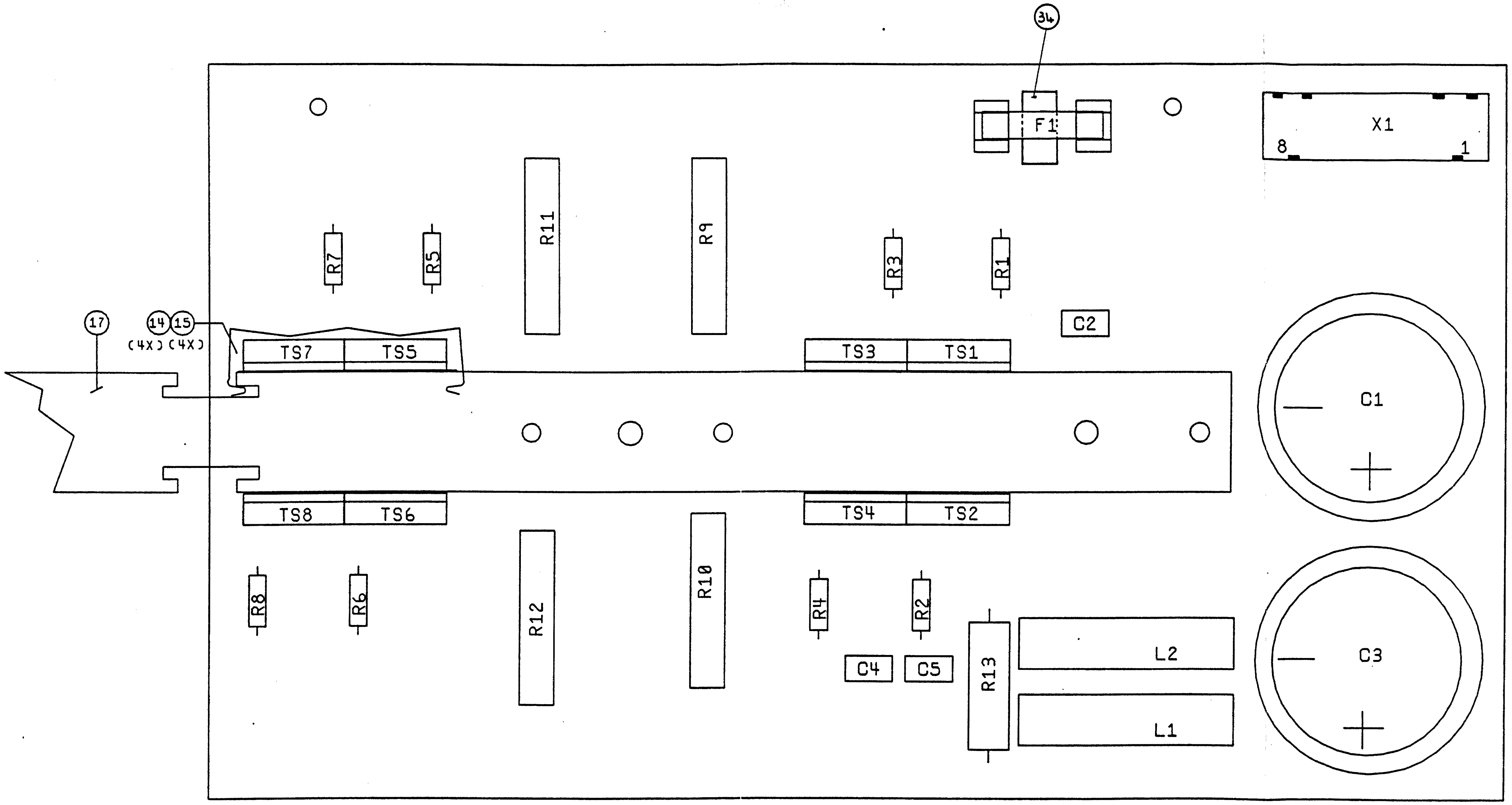
TOP VIEW


R126
R225
C111
C106
C112
R227
R224
R108
R107
R116
C110
C105
R105
C104
R103
C108
R114
R101
C107
C109
C138
R110
R167
R166
C113
R222
R230
C134
R157
R229
R232
R236
R233
C117
C123
R223
R123
R226
R120
R122
R132
R231
R235
R238
R234
R237
C116
C119
C118
IC101
IC102
R139
R130
R150
R156
R137
C132
R151
R140
C137
R161
R153
R163
R164
R162
R133
R136
R135
R134
R141
R154
R165
R145
C120
R152
R155
C139
R168
C135
R158
R192
R190
C122
C121
R111
R143
R144
R174
R149
R148
R147
R142
R176
R175
R171
R180
R178
R172
R182
R181
R177
R179
R2
R160
C145
C144
R193
R191
C44
C45
R93
R91
C9
C4
R68
C39
R58
C35
C16
R213
R92
R90
R3
R14
R9
C7
C3
R1
R6
C11
C6
R8
C8
R16
C10
R5
C5
C22
R23
C38
R66
C13
R10
R67
C34
R57
IC2
IC1
R214
R210
R7
R205
R203
R202
R207
C12
R204
R20
R206
C18
R217
R218
R215
C17
C19
C23
R211
R212
R216
R50
R22
R204
C32
R54
R55
R51
R52
R53
R65
R32
R56
R37
R39
R38
C37
R40
R63
R64
R62
R11
C20
C21
R45
R44
R43
R49
R42
R47
R48
R74
R76
R75
R71
R72
R80
R79
R77
R78
R81
R82
Y
X

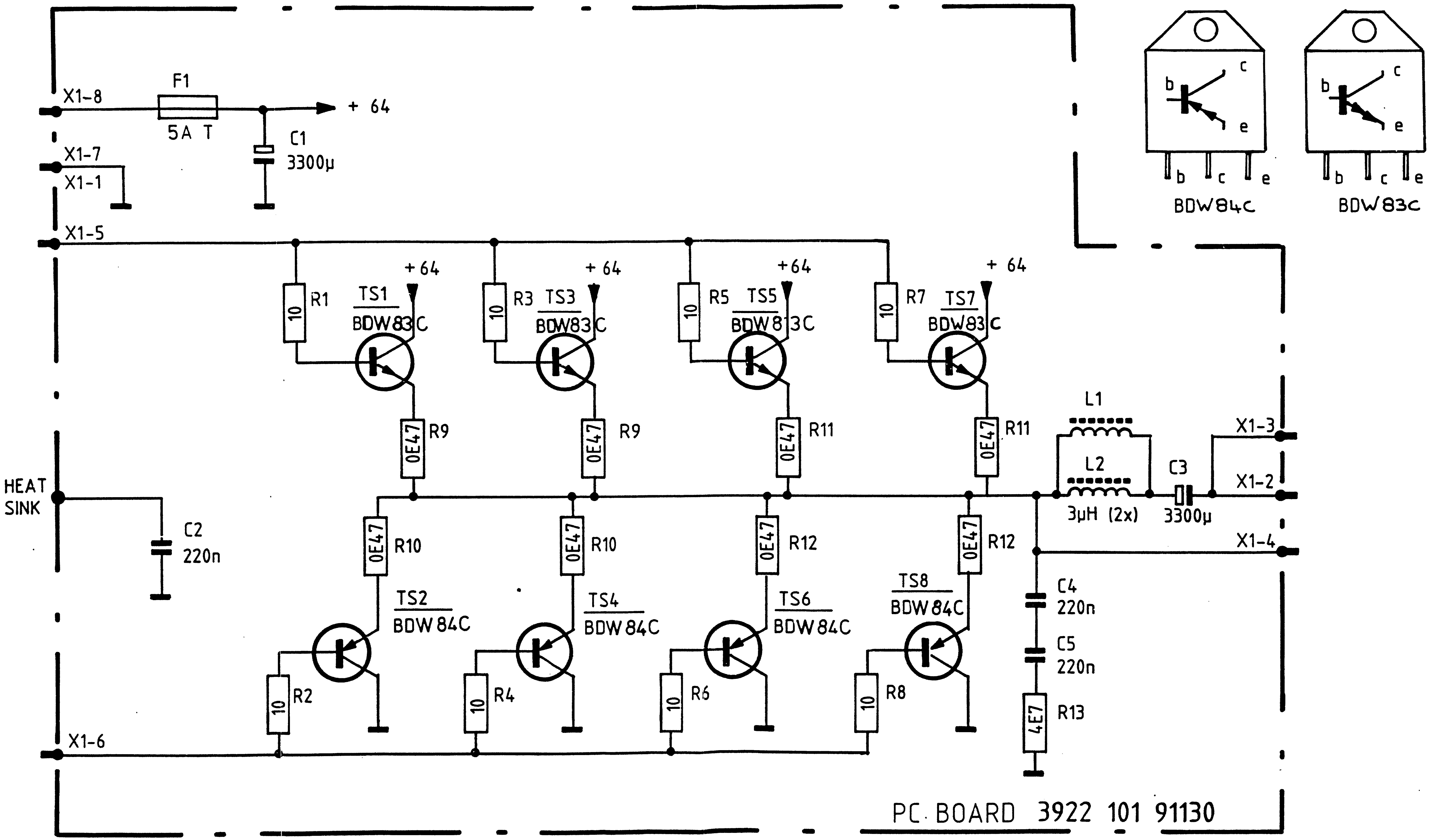
BOTTOM VIEW


AMPLIFIER 1
AMPLIFIER 2
testinput 500mV 20KHz
music input 500mV
call input 1V
heatsink
remote call/music
housing
fan drive
mute
MUTE
IC1 LF353M
IC2 LF356M
IC101 LF353M
IC102 LF356M
T1
T101
K1
K 101
TS1 BC807
TS2 BD911
TS7 BC846
TS11 BC846
TS12 BC857c
TS13 BC857c
TS14 BD912
TS16 BD911
TS17 BC817
TS18 BD912
TS19 BC817
TS20 BC807
TS21 BDW83C
TS22 BDW84C
TS23 BDW83C
TS24 BDW84C
TS29 BC857c
TS101 BC807
TS102 BD911
TS108 BC817
TS109 BC846
OVERHEATING PROTECTION
L1 3µH
L101 3µH
output 18V~
F1 3,15AT
F101 3,15AT
BAV99
BZX84
BC846 BC817
BC857c BC807
BD911
BD912
BDW84C MJH11017
BDW83C MJH11018
TOP VIEW
PC BOARD 3922 101 91550
K1
T1
BD1 /2 /101 /102
BOTTOM VIEW

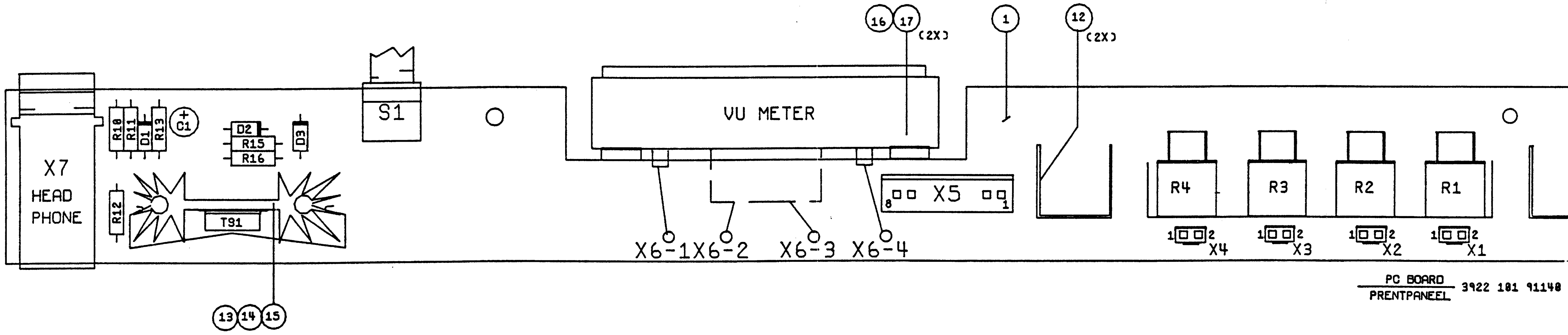
2 x 100W AMPLIFIER MODUL
CIRCUIT DIAGRA


34
F1
X1
8
1
R11
R9
R7
R5
R3
R1
C2
17
14
15
(4X) (4X)
TS7
TS5
TS3
TS1
C1
TS8
TS6
TS4
TS2
R8
R6
R12
R10
R4
R2
L2
C3
C4
C5
R13
L1

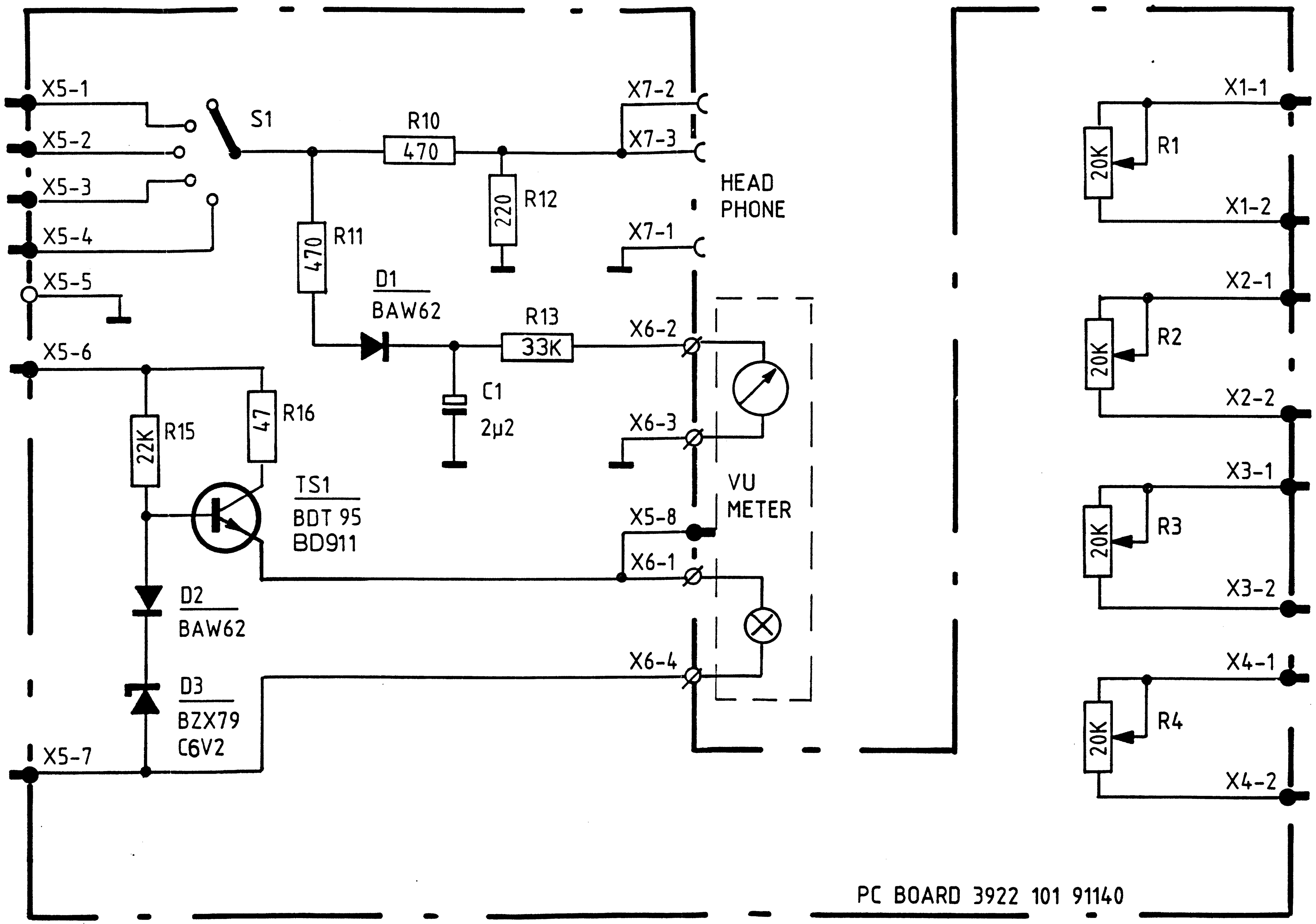
1 x 200W SLAVE AMPLIFIER MODULE
PCB COMPONENT LAYOUT

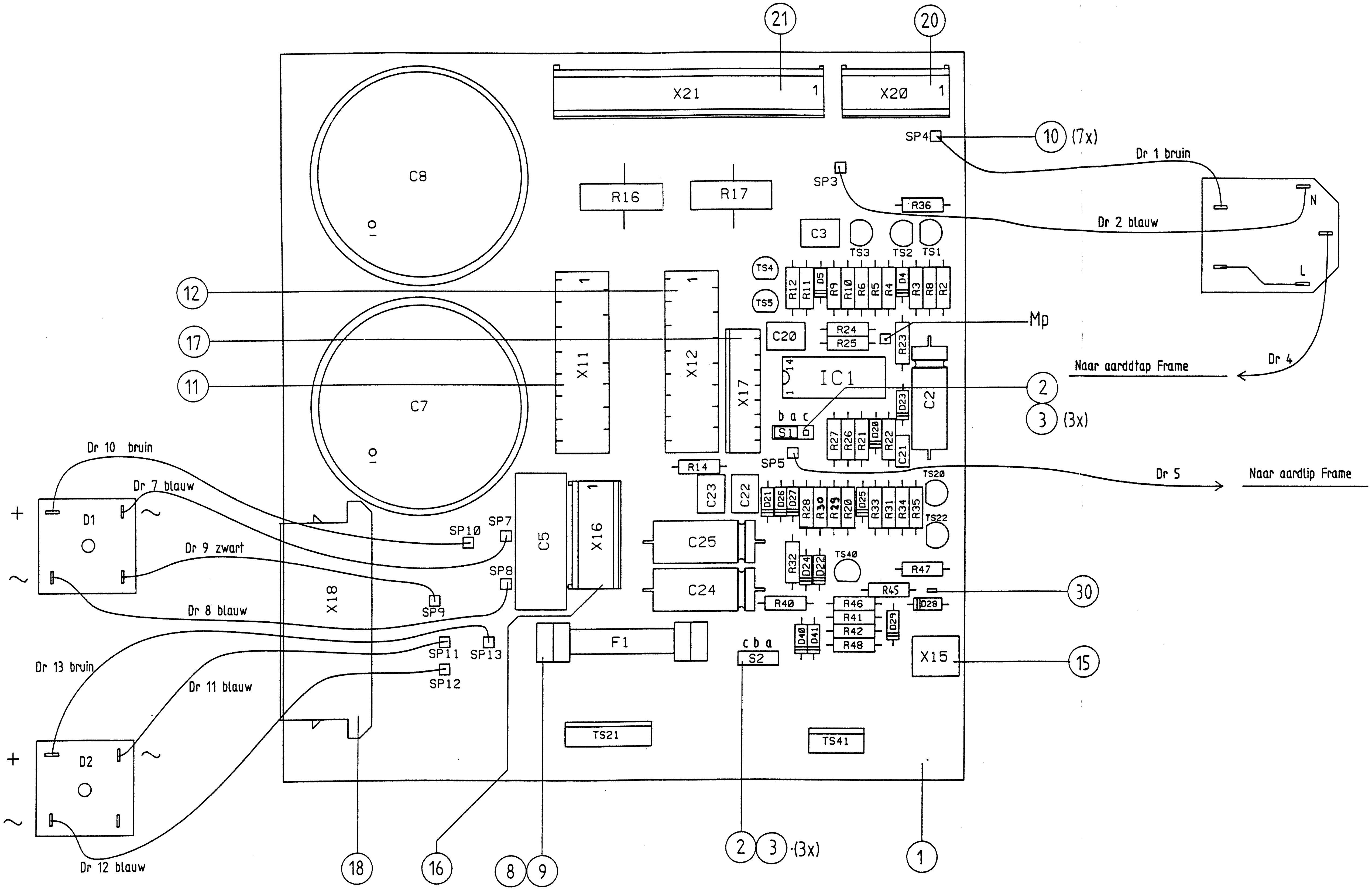

F1
5A T
+ 64
C1
3300µ
X1-8
X1-7
X1-1
X1-5
HEAT SINK
C2
220n
X1-6
R1
R3
R5
R7
10
TS1
TS3
TS5
TS7
BDW83C
+64
R9
R11
0E47
R10
R12
TS2
TS4
TS6
TS8
BDW84C
R2
R4
R6
R8
L1
L2
3µH (2x)
C3
3300µ
X1-3
X1-2
X1-4
C4
220n
C5
220n
R13
4E7
b
c
e
BDW84C
BDW83C
PC BOARD 3922 101 91130

1 x 200W SLAVE AMPLIFIER MODULE
CIRCUIT DIAGRAM


16
17
(2X)
1
12
(2X)
S1
VU METER
X7
HEAD
PHONE
R10
R11
D1
R13
C1
+
D2
R15
R16
D3
R12
TS1
X6-1
X6-2
X6-3
X6-4
8
X5
1
R4
R3
R2
R1
1
2
X4
X3
X2
X1
13
14
15
PC BOARD
PRENTPANEEL
3922 101 91140

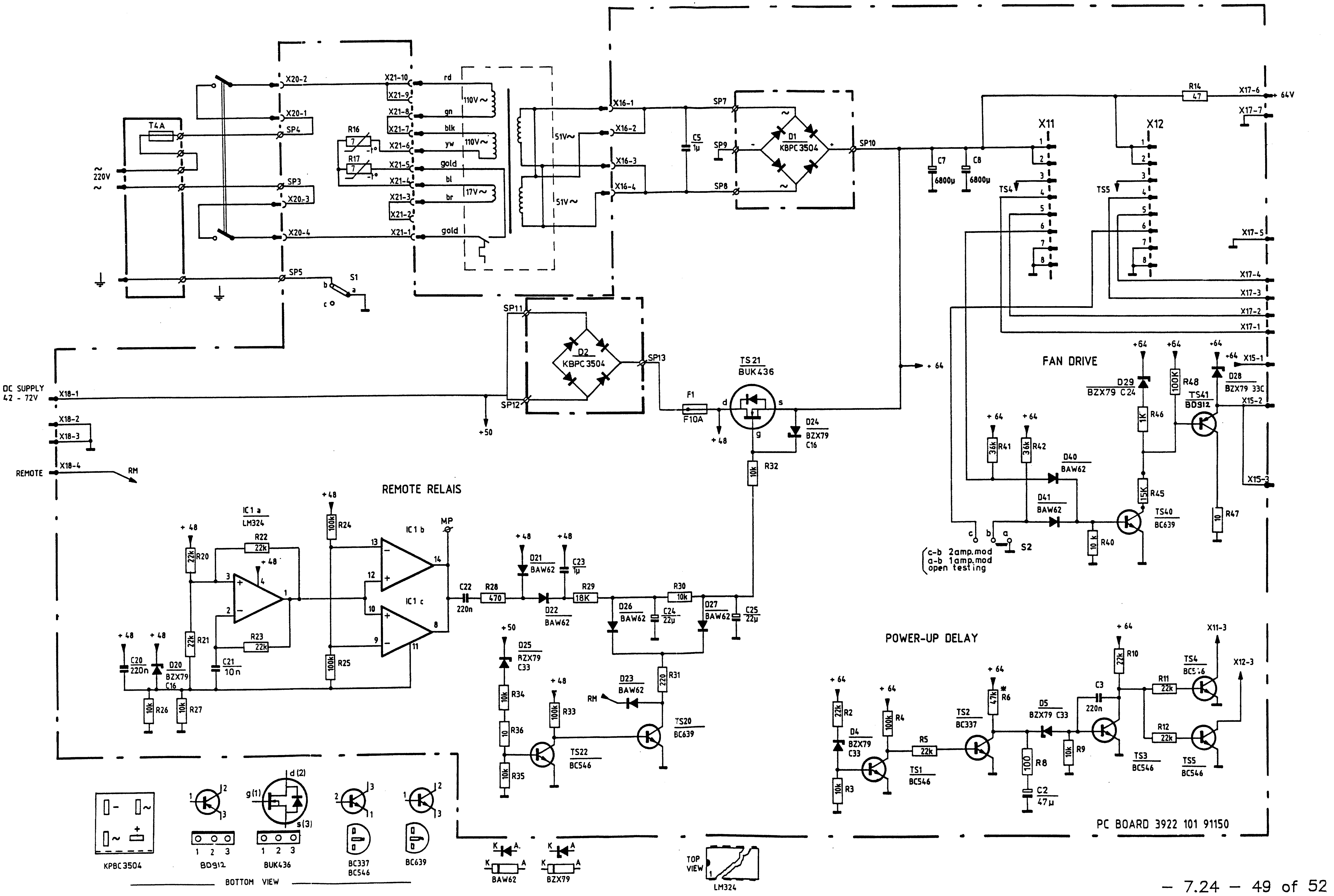
MONITOR PANEL
PCB COMPONENT LAYOUT


X5-1
X5-2
X5-3
X5-4
X5-5
X5-6
X5-7
S1
R10
470
R11
470
R12
220
D1
BAW62
R13
33K
C1
2μ2
R15
22K
R16
47
TS1
BDT 95
BD911
D2
BAW62
D3
BZX79
C6V2
X7-2
X7-3
X7-1
HEAD
PHONE
X6-2
X6-3
X5-8
X6-1
X6-4
VU
METER
X1-1
X1-2
X2-1
X2-2
X3-1
X3-2
X4-1
X4-2
R1
R2
R3
R4
20K
20K
20K
20K
PC BOARD 3922 101 91140

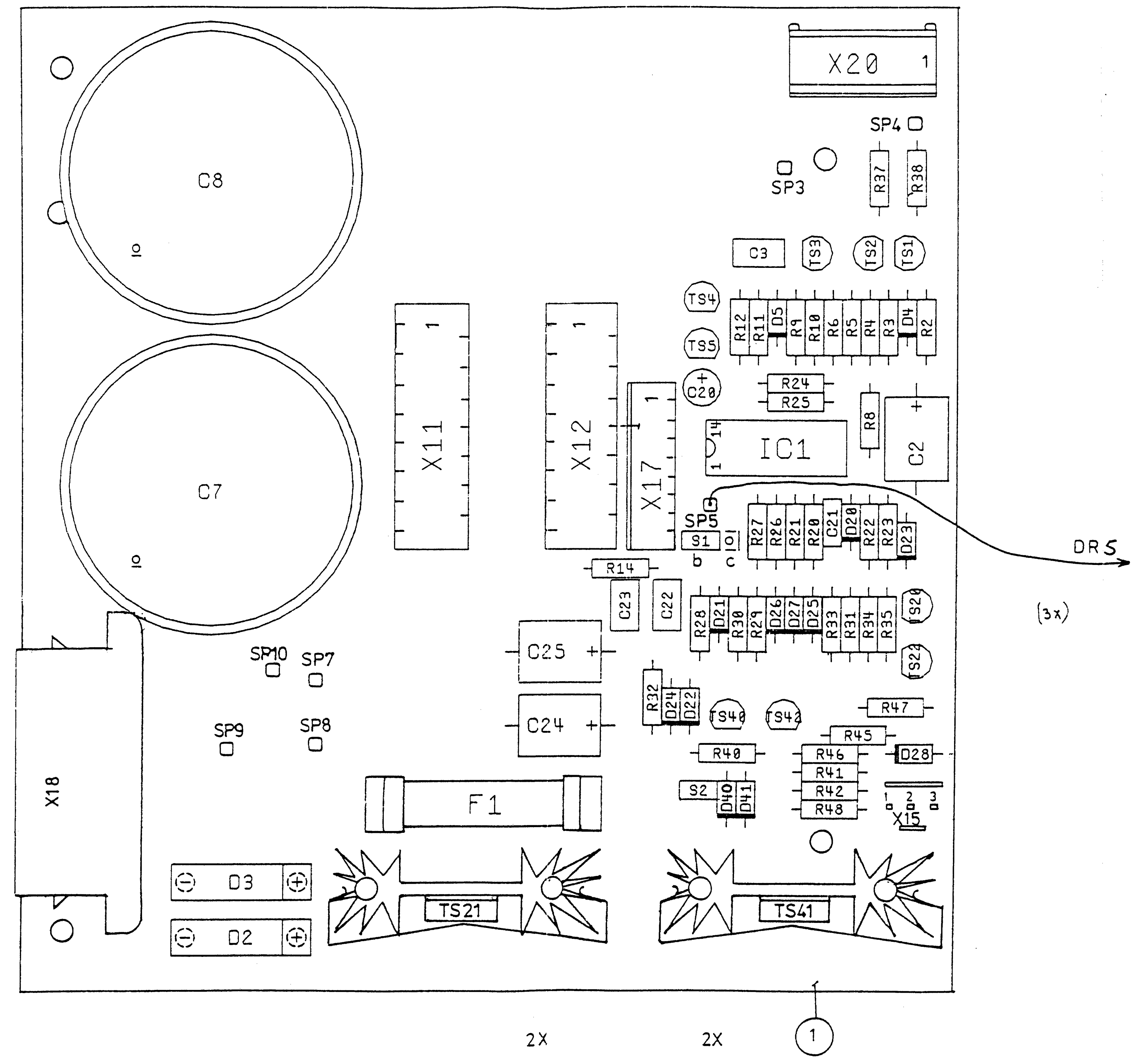

21
20
X21
X20
1
SP4
10 (7x)
Dr 1 bruin
SP3
R36
Dr 2 blauw
N
L
R16
R17
C8
C3
TS3
TS2
TS1
TS4
TS5
R12
R11
D5
R9
R10
R6
R5
R4
D4
R3
R8
R2
12
17
11
X11
X12
X17
C20
R24
R25
Mp
R23
IC1
14
C2
Naar aarddtap Frame
Dr 4
2
3 (3x)
b a c
S1
D23
R27
R26
R21
D20
R22
C21
C7
SP5
R14
Dr 5
Naar aardlip Frame
Dr 10 bruin
Dr 7 blauw
D1
+
~
Dr 9 zwart
SP10
SP7
SP8
SP9
C5
X16
C23
C22
TS20
D21
D26
D27
R28
R30
R29
R20
D25
R33
R31
R34
R35
TS22
C25
C24
R32
D24
D22
TS40
R47
R45
30
X18
Dr 8 blauw
R40
R46
R41
R42
R48
D29
D28
D40
D41
SP11
SP13
SP12
F1
c b a
S2
X15
15
Dr 13 bruin
Dr 11 blauw
D2
TS21
TS41
Dr 12 blauw
18
16
8
9
2
3 (3x)
1

PC BOARD / PRENTPANEEL 3922 101 91150

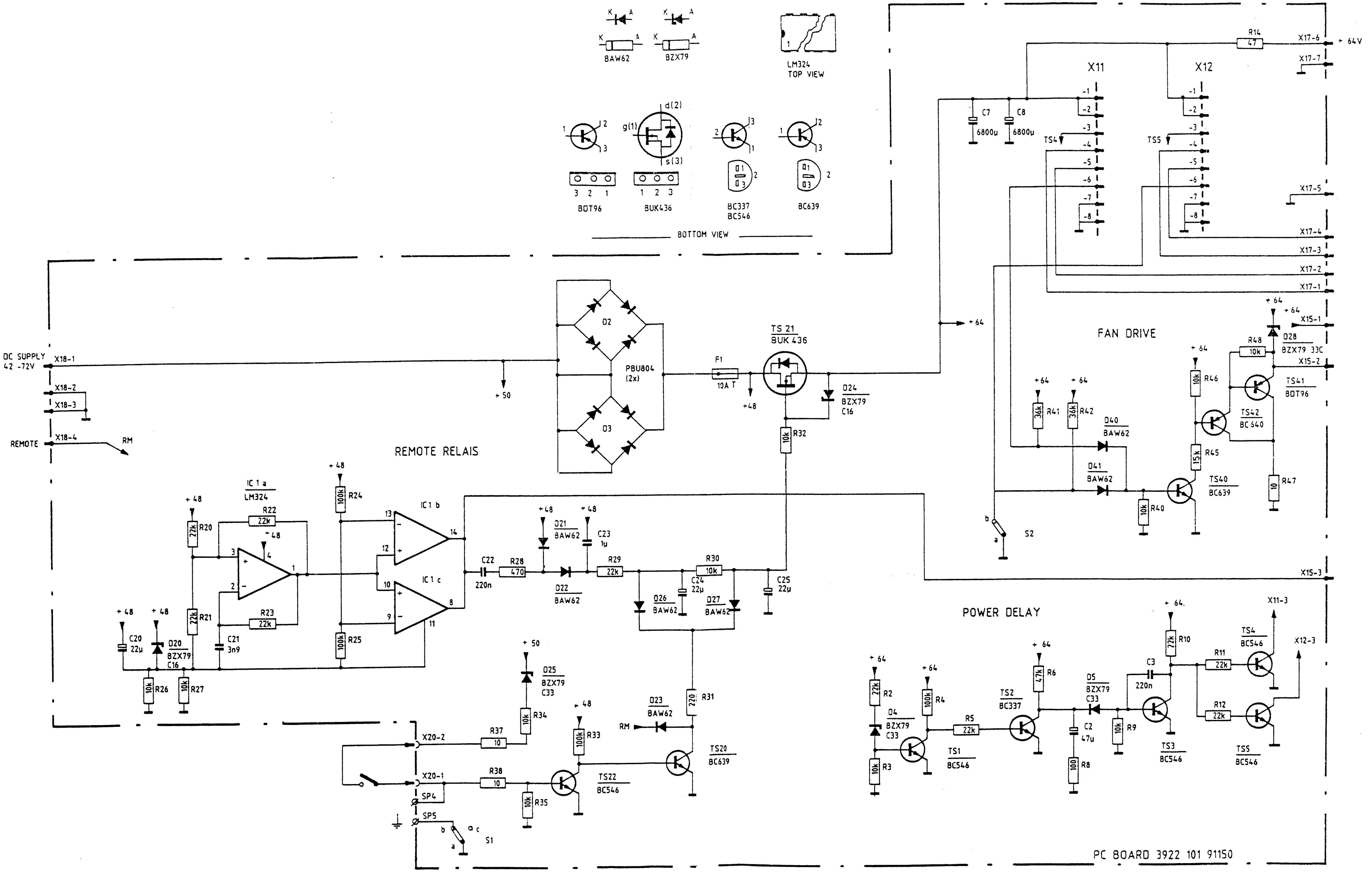
AC/DC POWER SUPPLY
PCB COMPONENT LAYOUT


220V
T4A
SP4
SP3
SP5
X20-2
X20-1
X20-3
X20-4
S1
a
b
c
R16
R17
X21-10
X21-9
X21-8
X21-7
X21-6
X21-5
X21-4
X21-3
X21-2
X21-1
rd
gn
blk
yw
gold
bl
br
gold
110V~
110V~
17V~
51V~
51V~
X16-1
X16-2
X16-3
X16-4
C5
1µ
SP7
SP9
SP8
D1
KBPC 3504
SP10
C7
6800µ
C8
6800µ
R14
47
X17-6
64V
X17-7
X11
X12
TS4
TS5
X17-5
X17-4
X17-3
X17-2
X17-1
SP11
D2
KBPC 3504
SP13
SP12
DC SUPPLY
42 - 72V
X18-1
X18-2
X18-3
REMOTE
X18-4
RM
+50
F1
F10A
+48
TS 21
BUK 436
d
s
g
D24
BZX79
C16
+ 64
R32
10k
FAN DRIVE
+64
D29
BZX79 C24
R48
100K
TS41
BD912
D28
BZX79 33C
X15-1
X15-2
X15-3
R46
1K
R41
36k
R42
36k
D40
BAW62
D41
BAW62
R45
15K
TS40
BC639
R47
10
R40
10 k
S2
c-b 2amp.mod
a-b 1amp.mod
open testing
REMOTE RELAIS
IC1 a
LM324
R22
22k
R20
22k
R21
22k
R23
22k
C20
220n
D20
BZX79
C16
C21
10n
R26
10k
R27
10k
R24
100k
R25
100k
IC1 b
IC1 c
MP
C22
220n
R28
470
D21
BAW62
C23
1µ
D22
BAW62
R29
18K
R30
10k
D26
BAW62
C24
22µ
D27
BAW62
C25
22µ
R31
220
D25
BZX79
C33
R34
10k
R36
10
R35
10k
R33
100k
D23
BAW62
TS20
BC639
TS22
BC546
POWER-UP DELAY
R2
22k
D4
BZX79
C33
R3
10k
R4
100k
TS1
BC546
R5
22k
TS2
BC337
R6
47k
D5
BZX79 C33
R8
100
C2
47µ
C3
220n
R9
10k
R10
22k
R11
22k
R12
22k
TS3
BC546
TS4
BC546
TS5
BC546
X11-3
X12-3
PC BOARD 3922 101 91150
KPBC3504
BD912
BUK436
d (2)
g(1)
s(3)
BC337
BC546
BC639
BOTTOM VIEW
BAW62
BZX79
K
A
TOP VIEW
LM324

AC/DC POWER SUPPLY
CIRCUIT DIAGRAM


X20
1
SP4
SP3
R37
R38
C8
C3
TS3
TS2
TS1
TS4
TS5
R12
R11
D5
R9
R10
R6
R5
R4
R3
D4
R2
C20
R24
R25
R8
C2
IC1
14
1
X11
X12
X17
C7
SP5
S1
b
c
R27
R26
R21
R20
C21
D20
R22
R23
D23
DR5
(3x)
R14
C23
C22
R28
D21
R30
R29
D26
D27
D25
R33
R31
R34
R35
TS20
TS24
C25
C24
SP10
SP7
SP9
SP8
R32
D24
D22
TS40
TS42
R47
R45
R40
R46
R41
R42
R48
D28
S2
D40
D41
X15
X18
F1
D3
D2
TS21
TS41
2X
2X
1

PC BOARD 3922 101 91150


BAW62
BZX79
LM324
TOP VIEW
BDT96
BUK436
BC337
BC546
BC639
BOTTOM VIEW
d(2)
g(1)
s(3)
DC SUPPLY
42 -72V
X18-1
X18-2
X18-3
X18-4
REMOTE
RM
D2
D3
PBU804
(2x)
F1
10A T
TS 21
BUK 436
D24
BZX79
C16
R32
10k
+ 50
+ 48
+ 64
C7
6800μ
C8
6800μ
X11
X12
TS4
TS5
R14
47
X17-6
X17-7
X17-5
X17-4
X17-3
X17-2
X17-1
+ 64V
FAN DRIVE
X15-1
X15-2
X15-3
R48
10k
D28
BZX79 33C
TS41
BDT96
TS42
BC540
R46
R45
15k
R47
R41
36k
R42
D40
BAW62
D41
BAW62
TS40
BC639
R40
S2
REMOTE RELAIS
IC 1 a
LM324
IC1 b
IC1 c
R20
22k
R21
R22
R23
R24
100k
R25
R26
R27
C20
22μ
D20
BZX79
C16
C21
3n9
C22
220n
R28
470
D21
BAW62
D22
BAW62
C23
1μ
R29
22k
R30
10k
C24
22μ
C25
22μ
D26
BAW62
D27
BAW62
D25
BZX79
C33
R31
220
R34
D23
BAW62
TS20
BC639
X20-2
X20-1
R37
10
R38
10
R33
100k
R35
TS22
BC546
SP4
SP5
S1
POWER DELAY
R2
D4
BZX79
C33
R3
R4
R5
22k
TS1
BC546
TS2
BC337
R6
47k
D5
BZX79
C33
C2
47μ
R8
100
R9
C3
220n
R10
TS3
BC546
R11
R12
TS4
BC546
TS5
BC546
X11-3
X12-3
PC BOARD 3922 101 91150

DC POWER SUPPLY
CIRCUIT DIAGRAM

8.1 Service Information : 4822 861 05004

8.2 Service Information : 4822 861 05005

PHILIPS

Service Information

Communication & Security Systems

Date : July 4, 1991

Catagory : Documentation Changes

Article group : SAG 6100

Product : SQ 45 Amplifiers

Service Manual : 4822 733 24397

Reason : Additional type-numbers because of different colour

Contents : Additional Philips Consumer Spare-parts

The SQ 45 type-numbers concearned:

LBB 1331/30; LBB 1331/40; LBB 1332/30; LBB 1332/40;
LBB 1335/30; LBB 1335/40; LBB 1342/30; LBB 1342/40;
LBB 1343/30; LBB 1343/40; LBB 1344/30; LBB 1344/40;
LBB 1344/50; LBB 1345/30; LBB 1345/40; LBB 1345/50;
LBB 1346/30; LBB 1346/40; LBB 1346/50; LBB 1347/30;
LBB 1347/40; LBB 1347/50; LBB 1348/30; LBB 1348/40;
LBB 1348/50.

Additional Spare-parts (colour related):

Front-panel	5322 447 50149
Knob	5322 414 60769
Cover for knob	5322 462 41842
Handgrip	5322 498 10466

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Service I.P.G. Prof Audio
Breda, Holland

PHILIPS

Service Information

Communications & Security Systems Industrial Electronics

Date : July 4, 1991

Catagory : Documentation Changes

Article group : SAG 6100

Product : SQ 45 Amplifiers

Service Manual : 4822 733 24397

Reason : SOAR - protection - improvement

Contents : Description of changes

The SOAR - protection is the power-amplifier-output-transistor-protection. The recognition of a few applications initiated an improved protection of the output-stage of the 100W- and 200W - modules:

1 x 100W - module 5322 310 10527:
1 x 200W - module 5322 310 10439:

	old	new
C44 and C45:	47nF	100nF
R71 and R74:	22kΩ	68kΩ
R102 and R103:	2,2Ω	1 Ω
D23 and D24 (zener):	33 V	13 V

2 x 100W - module 5322 310 10435:

	old	new
C44, C45, C144 and C145:	47nF	100nF
R71, R74, R171 and R174:	22kΩ	68kΩ
R87, R88, R187 and R188:	10 Ω	0 Ω
D23, D24, D123 and D124 (zener):	33 V	13 V

The 'upgraded' module 1 x 100W has been implemented within the following typenumbers from serial-number ***** onwards:

Type-number:	Serial-number:
LBB 1342/00	664
LBB 1342/10	709
LBB 1342/20	601
LBB 1342/30	601
LBB 1342/40	638
LBB 1342/50	601

The 'upgraded' module 1 x 200W has been implemented within the following typenumbers from serial-number ***** onwards:

Type-number:	Serial-number:	Type-number:	Serial-number:
LBB 1335/00	601	LBB 1345/40	606
LBB 1335/10	601	LBB 1345/50	601
LBB 1335/30	601	LBB 1347/00	601
LBB 1335/40	603	LBB 1347/10	1081
LBB 1344/00	748	LBB 1347/20	601
LBB 1344/10	1260	LBB 1347/30	601
LBB 1344/20	601	LBB 1347/40	646
LBB 1344/30	601	LBB 1347/50	601
LBB 1344/40	636	LBB 1348/00	792
LBB 1344/50	601	LBB 1348/10	1666
LBB 1345/00	601	LBB 1348/20	601
LBB 1345/10	601	LBB 1348/30	601
LBB 1345/20	601	LBB 1348/40	812
LBB 1345/30	601	LBB 1348/50	601

The 'upgraded' module 2 x 100W has been implemented within the following typenumbers from serial-number ***** onwards:

Type-number:	Serial-number:	Type-number:	Serial-number:
LBB 1331/00	601	LBB 1343/50	601
LBB 1331/10	601	LBB 1345/00	601
LBB 1331/30	603	LBB 1345/10	601
LBB 1331/40	601	LBB 1345/20	601
LBB 1332/00	601	LBB 1345/30	601
LBB 1332/10	601	LBB 1345/40	606
LBB 1332/30	603	LBB 1345/50	601
LBB 1332/40	602	LBB 1346/00	601
LBB 1343/00	601	LBB 1346/10	1054
LBB 1343/10	825	LBB 1346/20	601
LBB 1343/20	601	LBB 1346/30	601
LBB 1343/30	601	LBB 1346/40	621
LBB 1343/40	611	LBB 1346/50	601

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Service Information

Communication & Security Systems Industrial Electronics

Date : 23 July 1992

Category : Documentation Changes

Article group : SAG 6100

Product : SQ 45 Amplifiers

Service Manual : 4822 733 24397

Reason : Improvements

Contents : See list

CONTENTS LIST

CHAPTER	DESCRIPTION	PAGE
1	SOAR-PROTECTION	2
2	QUIESCENT CURRENT ADJUSTMENT (only 200W module)	4
3	VU-METER	4
4	RELAY CIRCUIT	4
5	ADDITIONAL SPARE PARTS	5
	DIAGRAMS	
	FIGURE 1 PCB COMPONENT LAYOUT 1X100W MODULE	6
	FIGURE 2 PCB COMPONENT LAYOUT 1X200W MODULE	7
	FIGURE 3 PCB COMPONENT LAYOUT 2X100W MODULE	8
	FIGURE 4 CIRCUIT DIAGRAM 1X100W MODULE	9
	FIGURE 5 CIRCUIT DIAGRAM 1X200W MODULE	10
	FIGURE 6 CIRCUIT DIAGRAM 2X100W MODULE	11

1 SOAR PROTECTION

The possibility occurs that the power-amplifier-output-transistors become defective when:

- The output is short circuited, (not a normal situation) and, a too high input signal (+10dBV) is inputted, (not a normal situation), and power switched on.

For this reason the SOAR - protection has been changed. Experience to date has indicated an improved protection of the output-stage of the 100W- and 200W - modules:

NOTE: For modifying the amplifier modules see also Service Information 4822 861 05005 (SOAR protection improvement) date july 4 1991 !!

1 x 100W - module 5322 310 10527:
1 x 200W - module 5322 310 10439:

		old	new
	C37 and C38	68uF/10V	22uF/50V
	C42 and C43	220uF/25V	47uF/63V
	C46	2.2uF/63V	4.7uF/63V
	R32	8K2	6K8
	R56	10E	22E
	R89	---------	680E
	R101	22E	47E
1X200W	TS21, TS23, TS25, TS27	BDV65B TS	BDV67B TS
1X200W	TS22, TS24, TS26, TS28	BDV64B TS	BDV66B TS
1X100W	TS21, TS25	BDV65B TS	BDV67B TS
1X100W	TS22, TS26	BDV64B TS	BDV66B TS

2 x 100W - module 5322 310 10435 :

	old	new
C37, C38, C137 and C138	68uF/10V	22uF/50V
C42, C43, C142 and C143	220uF/25V	47uF/63V
C46, C146	2.2uF/63V	10uF/63V
R32, R132	8K2	6K8
R64, R164	47E	68E
R89, R189	---------	680E
TS21, TS23, TS121, TS123	BDV65B TS	BDV67B TS
TS22, TS24, TS122, TS124	BDV64B TS	BDV66B TS

NOTE: The above mentioned power transistors are implemented at the factory from the serial numbers described on the following pages (right side), or when not a serial number described on the right hand side, the serial numbers continuing on the left side. All other modifications are implemented from the serial numbers on the left hand side onwards !

The ' upgraded ' module 1 x 100W has been implemented within the following typenumbers from serial-number ***** onwards:

Type-number:	Serial-number:	
LBB 1342/00	664	
LBB 1342/10	718	
LBB 1342/20	601	
LBB 1342/30	640	643
LBB 1342/40	831	872
LBB 1342/50	601	

The 'upgraded' module 1 x 200W has been implemented within the following typenumbers from serial-number ***** onwards:

Type-number:	Serial-number:	
LBB 1335/00	606	
LBB 1335/10	601	
LBB 1335/30	604	
LBB 1335/40	612	
LBB 1344/00	748	
LBB 1344/10	1314	
LBB 1344/20	601	
LBB 1344/30	671	
LBB 1344/40	1238	
LBB 1344/50	601	
LBB 1345/00	602	
LBB 1345/10	603	
LBB 1345/20	601	
LBB 1345/30	604	
LBB 1345/40	650	664
LBB 1345/50	601	
LBB 1347/00	601	
LBB 1347/10	1105	
LBB 1347/20	601	
LBB 1347/30	626	634
LBB 1347/40	1107	1229
LBB 1347/50	601	
LBB 1348/00	792	
LBB 1348/10	1825	
LBB 1348/20	601	
LBB 1348/30	667	700
LBB 1348/40	2305	2690
LBB 1348/50	601	

The 'upgraded' module 2 x 100W has been implemented within the following typenumbers from serial-number ***** onwards:

Type-number:	Serial-number:		Type-number:	Serial-number:	
LBB 1331/00	601		LBB 1343/50	601	
LBB 1331/10	602		LBB 1345/00	601	
LBB 1331/30	605		LBB 1345/10	601	
LBB 1331/40	610		LBB 1345/20	601	
LBB 1332/00	601		LBB 1345/30	601	
LBB 1332/10	602		LBB 1345/40	606	
LBB 1332/30	604		LBB 1345/50	601	
LBB 1332/40	606		LBB 1346/00	601	
LBB 1343/00	601		LBB 1346/10	1054	
LBB 1343/10	861		LBB 1346/20	601	
LBB 1343/20	601		LBB 1346/30	609	615
LBB 1343/30	612	630	LBB 1346/40	929	1060
LBB 1343/40	822	860	LBB 1346/50	620	

2 QUIESCENT CURRENT ADJUSTMENT

To reduce the thermal runaway between the amplifier module and slave module, it is necessarily to adjust the quiescent-current, this must be done only at the 1x200W amplifier module, (when the amplifier is COLD !!!)

Adjust R69 slowly to the right until the voltage between point X5-1 and X5-3 reaches 10 ± 1.5 mV.

This modification has been done at the factory from all above mentioned serial numbers onwards (left side).

3 VU METER

Diode D3 (BZX 79-C8V2) on the monitor PCB must be changed into BZX 79-C6V2. The reason is to increase the life of the VU meter lamp. For diagrams see page 66 and 67 of the manual.

4 RELAY CIRCUIT

To make the relay-circuit at the 1 x 100W, 2 x 100W and 1 x 200W module insusceptibility to interference, four resistors must be changed into another value. R9 and R109 must be changed into 100K, R10 and R110 must be changed into 10K.

This modification is already done at the factory from all serial numbers onwards on the left hand side of the serial numbers mentioned at chapter 1.

5 ADDITIONAL SPARE-PARTS

POWER TRANSISTOR (BDV 66B)	5322 130 42514
POWER TRANSISTOR (BDV 67B)	5322 130 61572
DIODE (D3) BZX 79-C6V2	4822 130 34167
HANDGRIP	5322 498 10466

H. Verstallen
Service I.P.G Prof Audio
Breda, Holland

8. GENERAL SERVICE INFORMATIONS

8.1	4822 861 05004	SQ45, New colour
8.2	4822 861 05005	SQ45, Soar Protection Improvement
8.3	4822 861 05023	SQ45, Soar Protection Improvement
8.4	4822 861 05032	SQ45, Wrong code numbers
8.5	4822 861 05034	SQ45, New, amplifier modules + /60 & /70 types
8.6	4822 861 05045	SQ45, Modification of modules

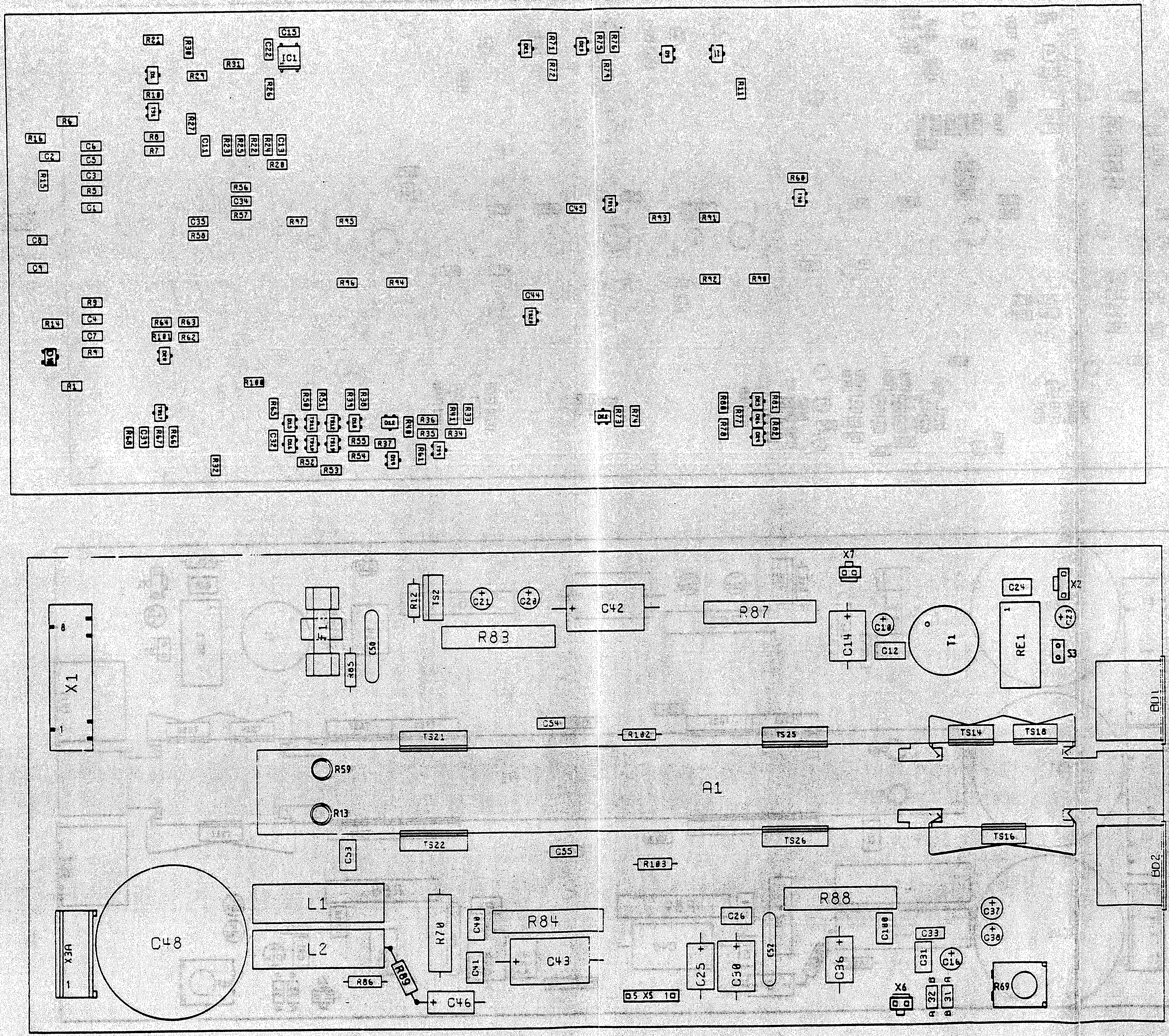
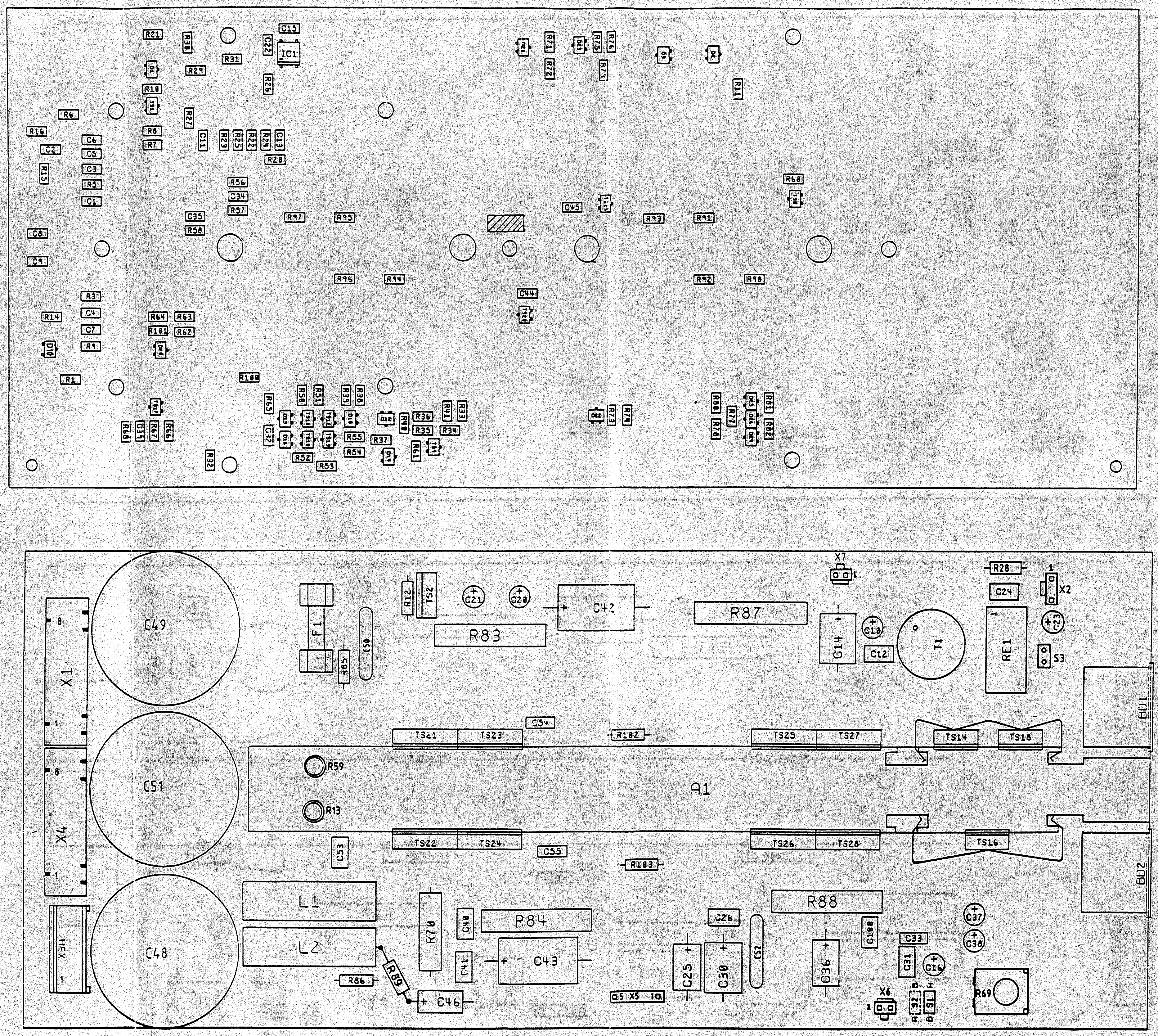

X7
C24
X2
R12
TS2
C21
C20
C42
R87
C14
C10
C12
T1
RE1
C23
S3
R83
C50
R85
X1
BU1
C54
TS21
R102
TS25
TS14
TS18
R59
A1
R13
TS22
TS26
TS16
C53
C55
R103
BU2
L1
C48
X3A
L2
R70
C40
R84
C26
R88
C37
C100
C33
C38
C41
C43
C25
C30
C52
C36
C31
C16
R86
R89
C46
X5
X6
R69

FIGURE 1, PAGE 6

PCB COMPONENT LAYOUT 1X100W MODULE


R21
R30
C15
C22
IC1
R31
R29
R26
R19
R6
R16
R27
C2
C6
C5
C3
R5
C1
R15
R8
R7
C11
R23
R25
R22
R24
C13
R28
R56
C34
R57
C35
R58
R97
R95
C8
C9
R96
R94
R3
C4
C7
R9
R14
R64
R63
R101
R62
R1
R100
R71
R72
R75
R76
R11
R68
C45
R93
R91
R92
R90
C44
R65
R50
R51
R31
R30
R36
R35
R34
R33
R37
R55
R54
R52
R53
R61
R32
R66
R67
R60
R73
R74
R80
R81
R82
R78
R77
C49
C51
C48
X1
X4
X5H
F1
R85
C50
R12
TS2
C21
C20
C42
R83
R87
X7
R28
C24
X2
C19
C14
C12
T1
RE1
C23
S3
BU1
C54
TS21
TS23
R102
TS25
TS27
TS14
TS18
R59
R13
A1
TS22
TS24
C55
TS26
TS28
TS16
C53
R103
BU2
L1
L2
R70
C40
R84
C26
R88
C37
C100
C36
C33
C41
C43
R89
C25
C30
C52
D36
C31
C16
R86
C46
X6
S2
S1
R69

▨ Afschermschot aansluiting

FIGURE 2, PAGE 7

PCB COMPONENT LAYOUT 1X200W MODULE

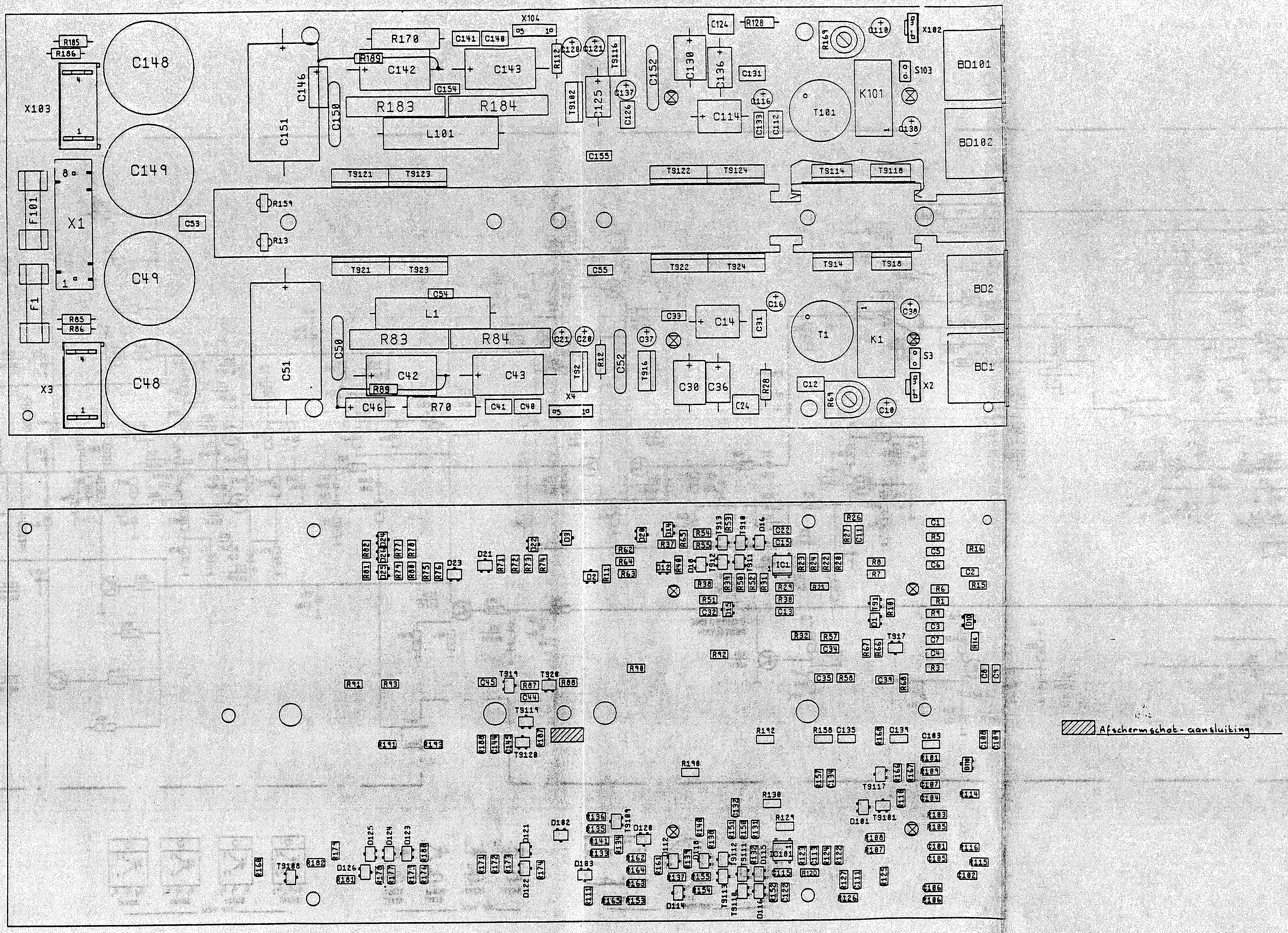

R185
R186
X103
C148
C149
C49
C48
F101
X1
F1
R85
R86
X3
C146
C151
C150
R170
R109
C142
C143
C154
R183
R184
L101
C141
C140
X104
R112
C120
C121
TS116
TS102
C125
C137
C126
C152
C130
C136
C124
R128
C131
C116
C114
C133
C112
R169
C118
X102
BD101
S103
K101
T101
C138
BD102
C155
TS121
TS123
TS122
TS124
TS114
TS118
R159
R13
C53
TS21
TS23
C55
TS22
TS24
TS14
TS18
BD2
C54
L1
R83
R84
C21
C20
R12
C52
C37
TS16
C33
C14
C31
C16
T1
K1
C38
S3
BD1
C50
C51
C42
C43
R89
C46
R70
C41
C48
X4
TS2
C30
C36
C24
R28
C12
R69
X2
C10
BOTTOM VIEW
▨ Afschermschot-aansluiting

FIGURE 3, PAGE 8

PCB COMPONENT LAYOUT 2X100W MODULE

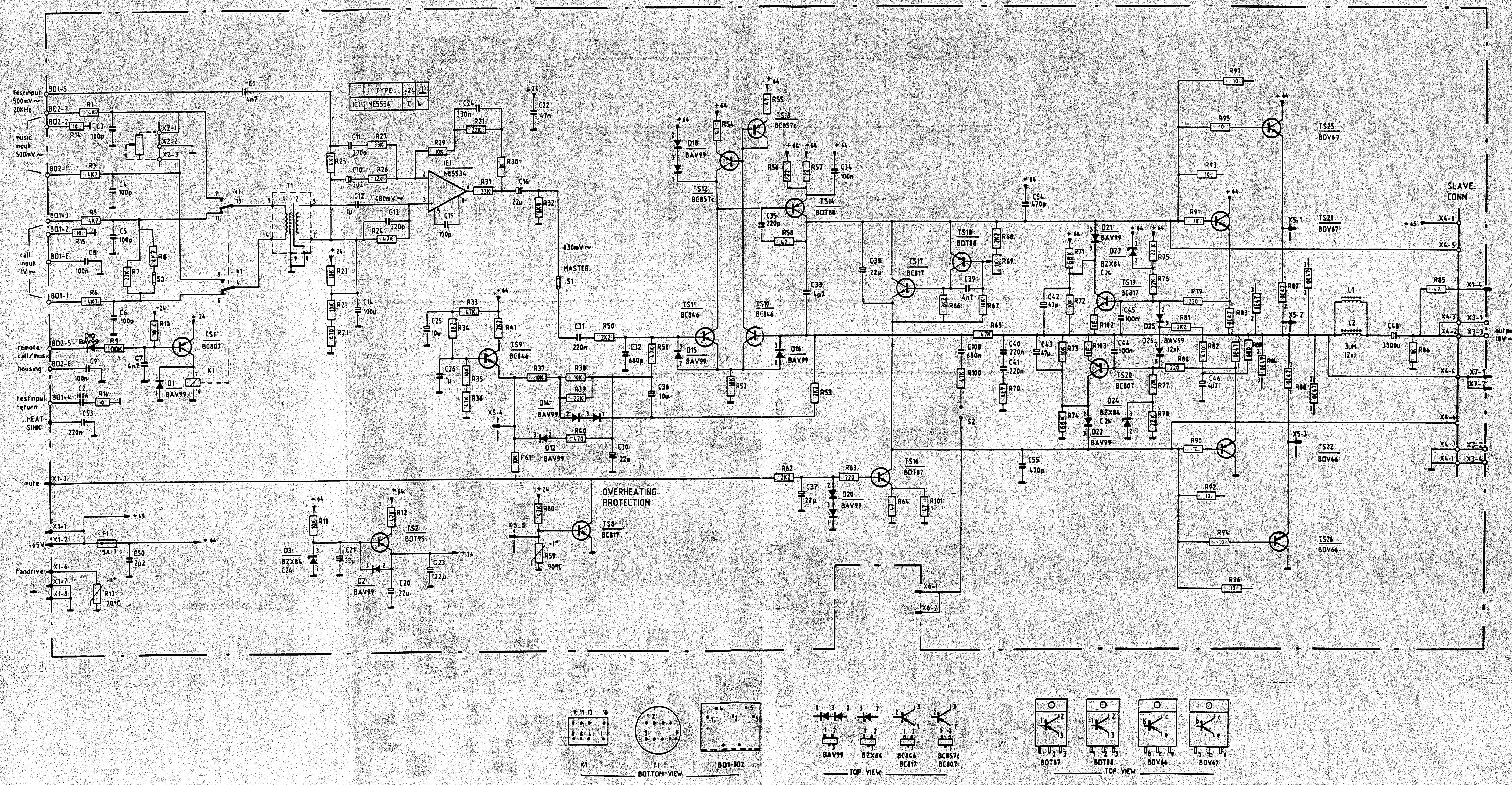
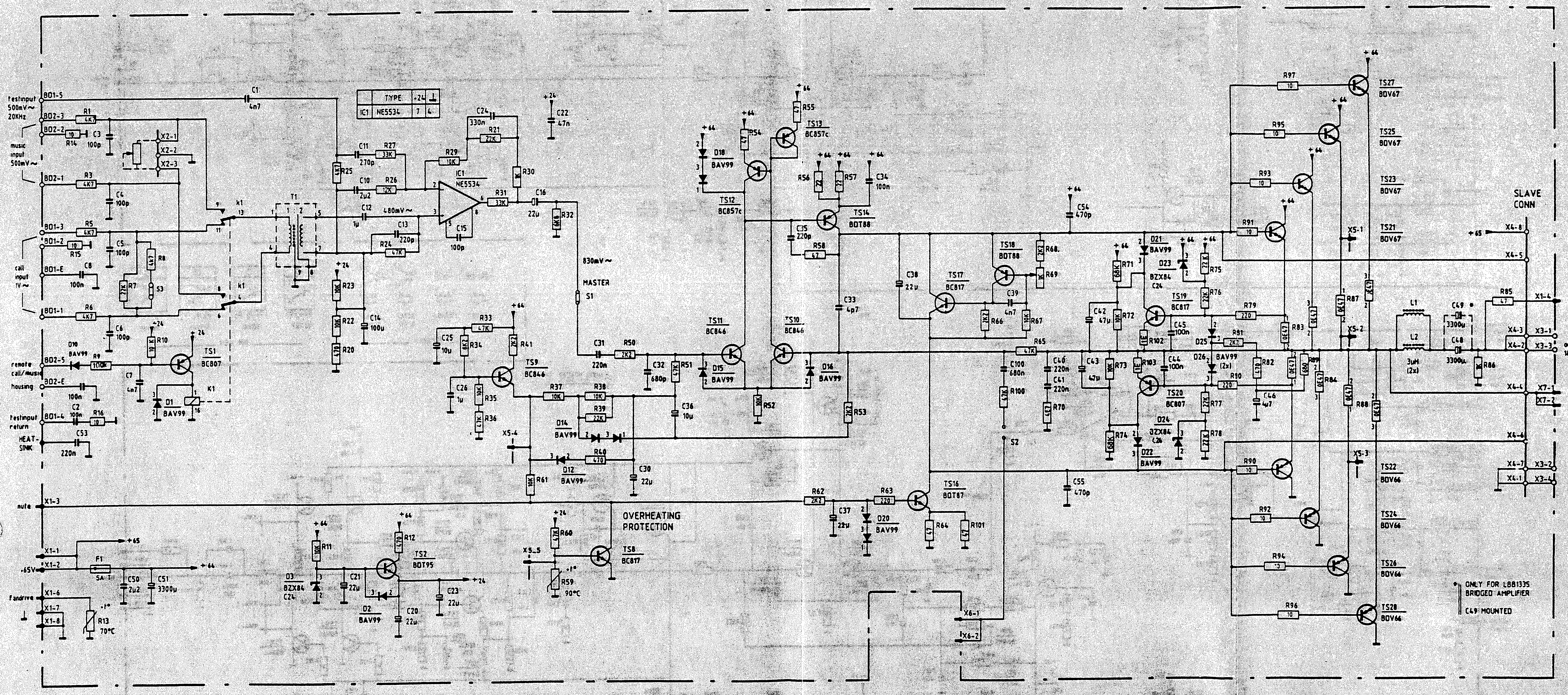

testinput 500mV~ 20KHz
music input 500mV~
call input 1V~
remote call/music
housing
testinput return
HEAT-SINK
mute
+65V
fandrive
BD1-5
BD2-3
BD2-2
BD2-1
BD1-3
BD1-2
BD1-E
BD1-1
BD2-5
BD2-E
BD1-4
X2-1
X2-2
X2-3
C1 4n7
R1 4K7
R14 10
C3 100p
R3 4K7
C4 100p
R5 4K7
R15 10
C5 100p
C8 100n
R7 22K
R8 4K7
S3
R6 4K7
C6 100p
D10 BAV99
R9 100K
C7 4n7
R10 10K
TS1 BC807
D1 BAV99
K1
C9 100n
C2 100n
R16 10
C53 220n
k1
T1
TYPE +24 ⊥
IC1 NE5534 7 4
C11 270p
R27 33K
R25 4K7
C10 2u2
R26 12K
C12 1u
480mV~
C13 220p
R24 47K
C24 330n
R21 22K
R29 10K
IC1 NE5534
C15 100p
R31 33K
R30 1K
C16 22u
R32 10K
C22 47n
830mV~
MASTER
S1
R23 10K
R22 10K
R20 47Ω
C14 100u
R33 47K
R34 18K
C25 10u
R41 2K2
TS9 BC846
C26 1u
R35 10K
R36 4K7
R37 10K
R38 10K
R39 22K
D14 BAV99
X5-4
R40 470
D12 BAV99
C30 22u
R61 10K
C31 220n
R50 2K2
C32 680p
R51 4K7
D15 BAV99
C36 10u
TS11 BC846
TS10 BC846
D16 BAV99
R52 10K
R53 2K2
D18 BAV99
R54 47
TS12 BC857c
TS13 BC857c
R55 47
R56 2K2
R57 2K2
C34 100n
C35 220p
R58 47
TS14 BDT88
C33 4p7
C38 22u
TS17 BC817
TS18 BDT88
R68 2K2
R69 1K
C39 4n7
R66 2K2
R67 10K
C54 470p
R65 47K
C100 680n
R100 47K
S2
C40 220n
C41 220n
R70 4K7
C43 47u
C42 47u
R73 10K
R72 10K
R71 68K
D21 BAV99
D23 BZX84 C24
R75 27K
R76 27K
TS19 BC817
C45 100n
R102 10K
R103 10K
C44 100n
D25 BAV99
R79 220
R81 2K2
D26 BAV99 (2x)
R80 220
R82 470
C46 4n7
TS20 BC807
R77 27K
D24 BZX84 C24
R78 27K
R74 68K
D22 BAV99
R83 0E47
R84 680
R97 10
R95 10
TS25 BDV67
R93 10
R91 10
TS21 BDV67
X5-1
R87 0E47
L1
L2 3uH (2x)
C48 3300u
R86
R85 47
X5-2
R88 0E47
R90 10
TS22 BDV66
X5-3
R92 10
R94 10
TS26 BDV66
R96 10
SLAVE CONN
X4-8
X4-5
X1-4
X4-3
X3-1
X4-2
X3-3
output 18V~
X4-4
X7-1
X7-2
X4-6
X4-7
X3-2
X4-1
X3-4
+65
R62 2K2
R63 220
C37 22u
D20 BAV99
TS16 BDT87
R64 47
R101 47
C55 470p
X6-1
X6-2
X1-3
X1-1
X1-2
F1 5A T
C50 2u2
+64
X1-6
X1-7
X1-8
R13 70°C
R11 10K
D3 BZX84 C24
C21 22u
TS2 BDT95
R12 470
D2 BAV99
C20 22u
C23 22u
+24
X5_5
R60 47K
R59 90°C
TS8 BC817
OVERHEATING PROTECTION
K1
T1
BD1-BD2
BOTTOM VIEW
BAV99
BZX84
BC846 BC817
BC857c BC807
TOP VIEW
BDT87
BDT88
BDV66
BDV67
TOP VIEW

FIGURE 4, PAGE 9

CIRCUIT DIAGRAM 1X100W MODULE


testinput 500mV~ 20KHz
BO1-5
BO2-3
BO2-2
music input 500mV~
BO2-1
BO1-3
BO1-2
call input 1V~
BO1-E
BO1-1
remote call/music
BO2-5
housing
BO2-E
testinput return
BO1-4
HEAT-SINK
C1 4n7
R1 4K7
R14 10
C3 100p
X2-1
X2-2
X2-3
R3 4K7
C4 100p
R5 4K7
R15 10
C5 100p
R8 4K7
R7 22K
S3
C8 100n
R6 4K7
C6 100p
D10 BAV99
R9 100K
R10 10K
TS1 BC807
C7 4n7
D1 BAV99
K1
k1
C2 100n
R16 10
C53 220n
T1
TYPE
+24
IC1 NE5534 7 4
C11 270p
R27 33K
C10 2u2
R26 12K
R25 4K7
C12 1u
480mV~
C13 220p
R24 47K
R23 10K
R22 10K
R20 470
C14 100u
C24 330n
R21 22K
R29 10K
IC1 NE5534
C15 100p
R31 33K
R30 1K
C16 22u
R32 6K8
C22 47n
830mV~
MASTER
S1
C25 10u
R33 47K
R34 6K2
R41 2K2
TS9 BC846
C26 1u
R35 10K
R36 4K7
R37 10K
R38 10K
R39 22K
D14 BAV99
X5-4
R40 470
D12 BAV99
C30 22u
R61 10K
C31 220n
R50 2K2
C32 680p
R51 10K
C36 10u
D15 BAV99
TS11 BC846
D18 BAV99
R54 47
TS12 BC857c
TS13 BC857c
R55 47
TS10 BC846
R52 10K
D16 BAV99
R53 10K
R56
R57
C34 100n
C35 220p
R58 47
TS14 BDT88
C33 4p7
C38 22u
TS17 BC817
TS18 BDT88
R68
R69
C39 4n7
R66 2K2
R67 10K
R65 47K
C100 680n
R100 47K
S2
C40 220n
C41 220n
R70 4K7
C54 470p
C43 47u
R71 68K
C42 47u
R72 10K
R73 10K
R74 68K
D21 BAV99
D23 BZX84 C24
R102
R103
TS19 BC817
R75 22K
R76 22K
C45 100n
C44 100n
D25
D26 BAV99 (2x)
R79 220
R81 2K2
R80 220
R82 470
C46 4u7
TS20 BC807
R77 22K
R78 22K
D24 BZX84 C24
D22 BAV99
C55 470p
R62 2K2
C37 22u
R63 220
D20 BAV99
TS16 BDT87
R64 47
R101 47
R97 10
TS27 BDV67
R95 10
TS25 BDV67
R93 10
TS23 BDV67
R91 10
TS21 BDV67
X5-1
X5-2
X5-3
R83 0E47
R87 0E47
R89 680
R84 0E47
R88 0E47
R90 10
TS22 BDV66
R92 10
TS24 BDV66
R94 10
TS26 BDV66
R96 10
TS28 BDV66
L1
L2
3uH (2x)
C49 * 3300u
C48 3300u
R85 47
R86
SLAVE CONN
+65
X4-8
X4-5
X1-4
X4-3
X4-2
X3-1
X3-3
output 18V ~
X4-4
X7-1
X7-2
X4-6
X4-7
X4-1
X3-2
X3-4
* ONLY FOR LBB1335 BRIDGED AMPLIFIER
C49 MOUNTED
mute
X1-3
X1-1
X1-2
+65V
F1 5A T
C50 2u2
C51 3300u
+64
fandrive
X1-6
X1-7
X1-8
R13 70°C
R11 10K
D3 BZX84 C24
C21 22u
R12 470
TS2 BDT95
D2 BAV99
C20 22u
C23 22u
+24
X5-5
R60 47K
R59 90°C
TS8 BC817
OVERHEATING PROTECTION
X6-1
X6-2

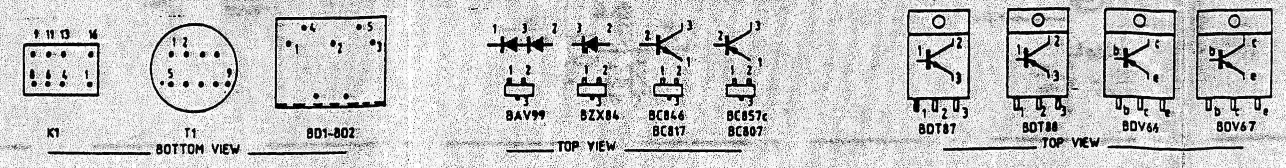

K1
T1 BOTTOM VIEW
BO1-BO2
BAV99
BZX84
BC846 BC817
BC857c BC807
TOP VIEW
BDT87
BDT88
BDV66
BDV67
TOP VIEW

FIGURE 5, PAGE 10

CIRCUIT DIAGRAM 1X200W MODULE

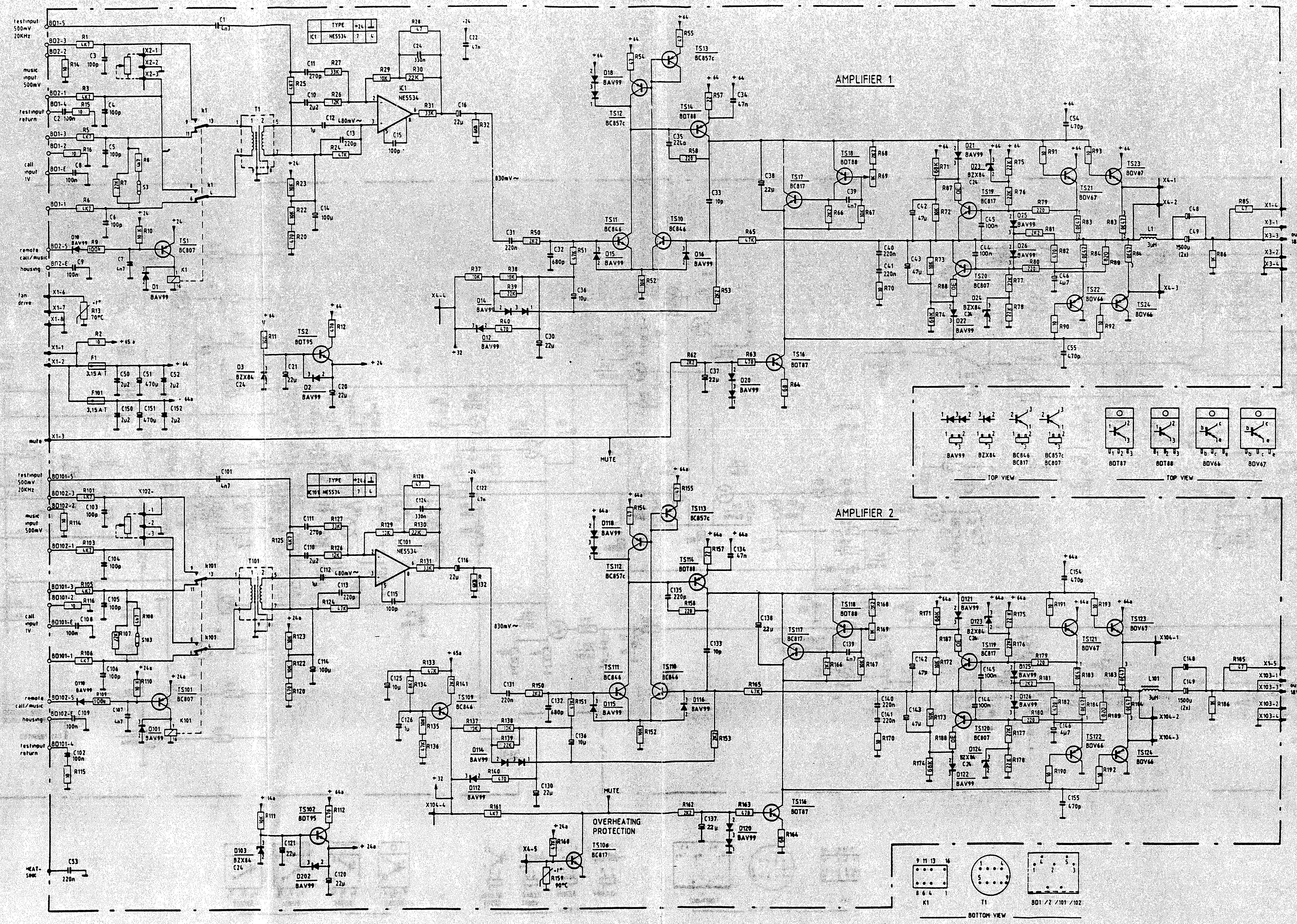

AMPLIFIER 1
AMPLIFIER 2
testinput 500mV 20KHz
music input 500mV
testinput return
call input 1V
remote call/music
housing
fan drive
mute
MUTE
output 18V~
OVERHEATING PROTECTION
HEAT-SINK
IC1 NE5534
IC101 NE5534
830mV~
480mV~
TOP VIEW
BAV99
BZX84
BC846 BC817
BC857c BC807
BDT87
BDT88
BDV66
BDV67
BOTTOM VIEW
K1
T1
BO1 /2 /101 /102

FIGURE 6, PAGE 11

CIRCUIT DIAGRAM 2X100W MODULE

8.4 Service Information : 4822 861 05032

PHILIPS

Service Information

Communication & Security Systems **Industrial Electronics**

Date : 17 December 1992

Category : Documentation Changes

Article group : SAG 6100

Product : SQ 45 Amplifiers

Service Manual : 4822 733 24397

Reason : Wrong Service Code-numbers

Contents : Description / New code numbers

The power transistors BDV66B and BDV67B Service code-numbers, had been wrongly indicated within the Service-Information 4822 861 05023.

Please change this items within your manual, in order to prevent mistakes:

Item:	New Service code-number:
BDV 66B	5322 130 63267
BDV 67B	5322 130 63268

H. Verstallen
Service I.P.G. Prof Audio,
Breda, Holland

8.5 Service Information : 4822 861 05034

PHILIPS

Service Information

Communication & Security Systems

Date : 1 November 1993

Category : Documentation Changes

Article group : SAG 6100
Customer Support
Supply Centre - Breda

Product : SQ 45 Amplifiers

Service Manual : 4822 733 24397

Reason : Introduction of new amplifier modules.
Introduction of new type numbers (/60, /70).

Contents : See contents list (page 2)

CONTENTS LIST

CHAPTER	DESCRIPTION	PAGE
0	CONTENTS LIST	2
1	DESCRIPTION OF PRODUCT CHANGES	3
2	DIFFERENT CONFIGURATIONS OF THE /30 AND /40 TYPES	4
3	AMPLIFIER INPUTS	6
4	SPARE PARTS	7
5	DIAGRAMS	8
	FIGURE 1 PCB LAYOUT 1x 100W MOD. (VERSION B)	8
	FIGURE 2 PCB LAYOUT 2x 100W MOD. (VERSION B)	9
	FIGURE 3 PCB LAYOUT 1x 200W MOD. (VERSION B)	10
	FIGURE 4 CIRCUIT DIAGRAM 1x 100W MOD. (VERSION B)	11
	FIGURE 5 CIRCUIT DIAGRAM 2x 100W MOD. (VERSION B)	12
	FIGURE 6 CIRCUIT DIAGRAM 1x 200W MOD. (VERSION B)	13
	FIGURE 7 PCB LAYOUT POWER SUPPLY	14
	FIGURE 8 CIRCUIT DIAGRAM POWER SUPPLY	15
	FIGURE 9 PCB LAYOUT 1x 100W MOD. (VERSION C, D)	16
	FIGURE 10 PCB LAYOUT 2x 100W MOD. (VERSION C, D)	17
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	FIGURE 12 CIRCUIT DIAGRAM 1x 100W MOD. (VER. C, D)	19
	FIGURE 13 CIRCUIT DIAGRAM 2x 100W MOD. (VER. C, D)	20
	FIGURE 14 CIRCUIT DIAGRAM 1x 200W MOD. (VER. C, D)	21

1 DESCRIPTION OF PRODUCT CHANGES

1.1 Increased reliability

Problems with SQ 45 amplifiers can occur when more of these amplifiers are mounted in 19 " racks and a permanent 20 kHz surveillance mode is applied and/or a too high capacitive load is connected to the output of the amplifier.
This causes an additional power dissipation in the amplifier modules and consequently a temperature increase that effects the reliability of the amplifier.
By selecting some other capacitors that can withstand higher temperatures the required reliability can be achieved again under these extreme circumstances.
In addition, by changing the PTC underneath the cooling fin on the amplifier module, the amplifier fan switches on at 60°C i.s.o. at 75°C.

1.2 New typenumbers

The following new type numbers have been added:

	TABLE-TOP	RACK MOUNT (19")
1x 100 W	LBB 1342/60	LBB 1342/70
2x 100 W	LBB 1343/60	LBB 1343/70
1x 200 W	LBB 1344/60	LBB 1344/70
4x 100 W	LBB 1346/60	LBB 1346/70
2x 200 W	LBB 1347/60	LBB 1347/70
1x 200 W + 1x 200 W slave	LBB 1348/60	LBB 1348/70

The above mentioned /60 and /70 type amplifiers are not equipped with an input transformer standard mounted on the amplifier PCB.

2 DIFFERENT CONFIGURATIONS OF THE /30 AND /40 TYPE AMPLIFIERS

Since the introduction of the SQ45 different configurations (versions) have been built and delivered by the factory. Below an overview of existing versions related to serial numbers (next page).

2.1 DIFFERENT VERSIONS

Version A
This is the first supplied amplifier version equipped with an input transformer and asymmetrical input and 85° C capacitors on the amplifier PCB.

Version B
This is the amplifier version without input transformer mounted on the amplifier PCB, with a symmetrical input and with 105° C capacitors mounted.

Version C
The amplifier version without input transformer mounted on the PCB, with a symmetrical input and with 125° C capacitors mounted.

Version D
The amplifier version with input transformer mounted on the PCB, with a symmetrical input and with 125° C capacitors mounted.

2.2 SERIAL NUMBER OVERVIEW FOR THE DIFFERENT VERSIONS OF SQ45 AMPLIFIERS

All serial numbers mentioned are the first number of the range of that amplifier version.

See next page for serial numbers

SERIAL NUMBER OVERVIEW

Type-number:	Version A	Version B	Version C	Version D
LBB 1342/30	600	653	664	667
LBB 1342/40	600	935	1062	1097
LBB 1343/30	600	626	636	638
LBB 1343/40	600	924	957	969
LBB 1344/30	600	778	846	855
LBB 1344/40	600	1623	1872	1908
LBB 1346/30	600	620	627	628
LBB 1346/40	600	1215	1462	1489
LBB 1347/30	600	665	670	671
LBB 1347/40	600	1450	1719	1848
LBB 1348/30	600	747	791	803
LBB 1348/40	600	3294	4055	4393

NOTE: All /60 and /70 type-number versions are equipped according to version C

2.3 OVERVIEW AMPLIFIER MODULE VERSUS SQ45 TYPENUMBER

	100W	2x 100W	1x 200W	SLAVE 1x 200W
LBB 1342/xx	x (1)			
LBB 1343/xx		x (1)		
LBB 1344/xx			x (1)	
LBB 1346/xx		x (2)		
LBB 1347/xx			x (2)	
LBB 1348/xx			x (1)	x (1)

NOTE: /xx stands for /30, /40, /60, /70

3 AMPLIFIER INPUTS

a.- All amplifier versions B, C and D have electronically balanced inputs on the new amplifier modules.
b.- All amplifier versions B and C do not have an input transformer mounted on the PCB.

NOTE: **For descriptions of the versions refer to paragraph 2.1.**

NOTE: **In case amplifiers with modules according to version B, C or D (symmetrical inputs) are mixed up with amplifiers with modules version A (asymmetrical inputs) is it necessary to short-circuit point 4 and 2 of the Call-test- input DIN connector (male).**
This will prevent problems with surveillance line-up procedures.

In case an application requires galvanically isolated inputs an input transformer can still be mounted on the amplifier PCB.
When installing a transformer on a PCB the following modification has to be carried out:

a.- Install a transformer at the place on the PCB that is designated for it.
b.- Remove following components:

On the 1x 100W and 1x 200W modules
R111, R112, R123, R132

On the 2x 100W module
R24, R124, R25, R125, R208, R228, R239, R249

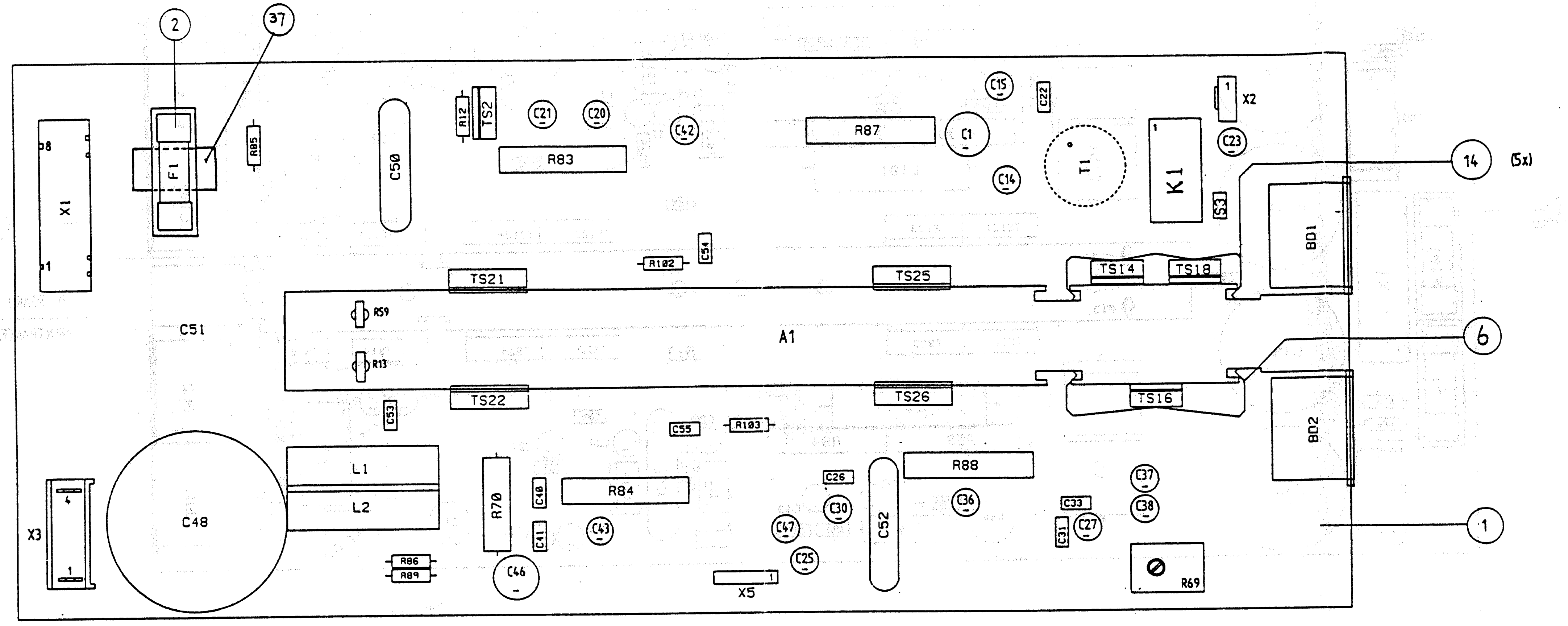
4 SPARE PARTS

The Spare Part ordering numbers for the modules according to versions C and D are listed below.
The amplifier modules are backwards compatible with the older versions A an B. The Spare-Part ordering numbers for these modules have been cancelled.

1 x 100W - module without input transformer	: 5322 310 10527
1 x 200W - module without input transformer	: 5322 310 10439
2 x 100W - module without input transformers	: 5322 310 10435
1 x 100W - module with input transformer	: 5322 214 91303
1 x 200W - module with input transformer	: 5322 214 91304
2 x 100W - module with input transformers	: 5322 214 91305
REM-DC.AC Power supply module	: 5322 310 10437

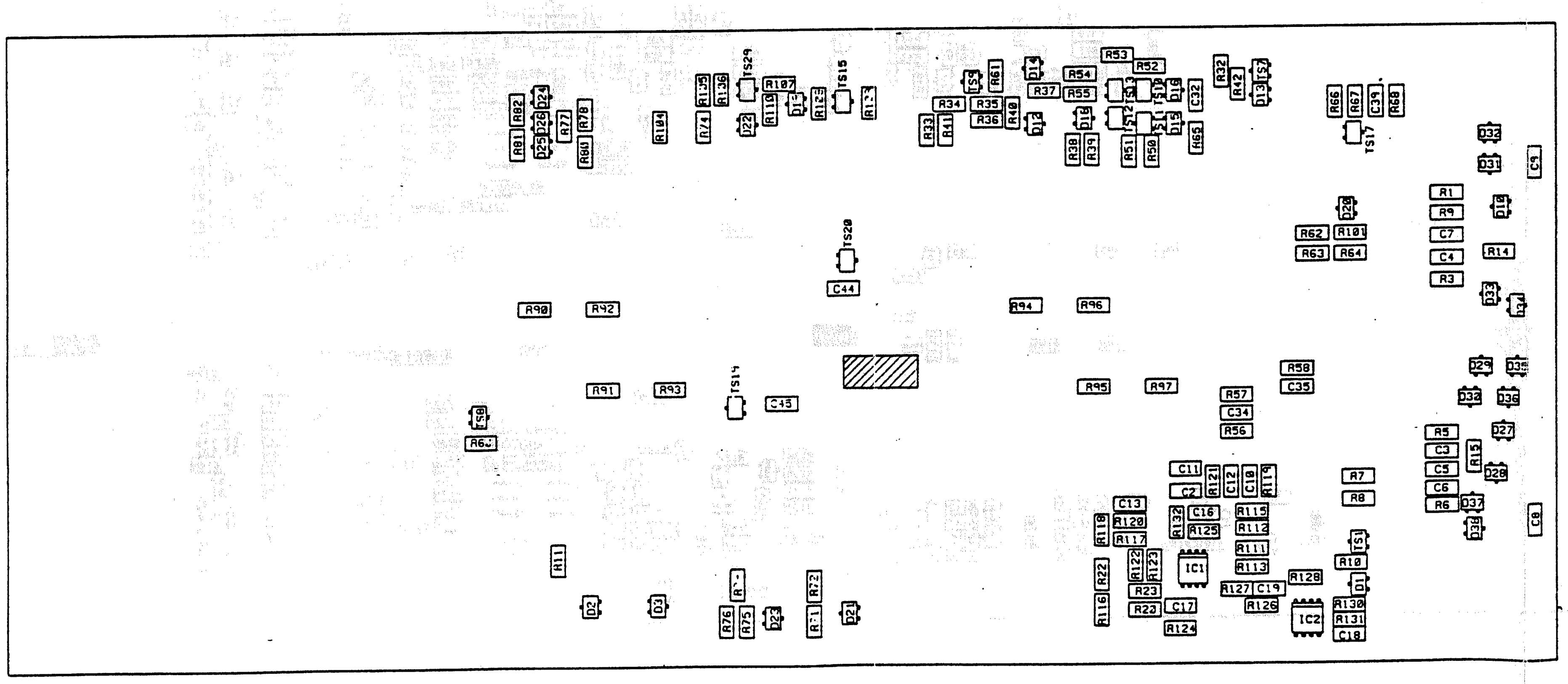
Please have these numbers added to your Service Manual and delete the old ones in order to prevent mistakes.

H. Verstallen
Customer Support
Supply Centre - Breda
Holland


2
37
14
(5x)
6
1
X1
8
1
F1
R85
C50
R12
TS2
C21
C20
R83
C42
R87
C1
C15
C22
C14
T1
K1
1
X2
C23
S3
BD1
C54
R102
TS21
TS25
TS14
TS18
R59
R13
C51
A1
TS22
TS26
TS16
BD2
C53
C55
R103
R88
L1
L2
X3
4
1
C48
R70
C40
C41
R84
C43
C26
C30
C52
C36
C37
C38
C33
C27
C31
C47
C25
R86
R89
C46
X5
R69

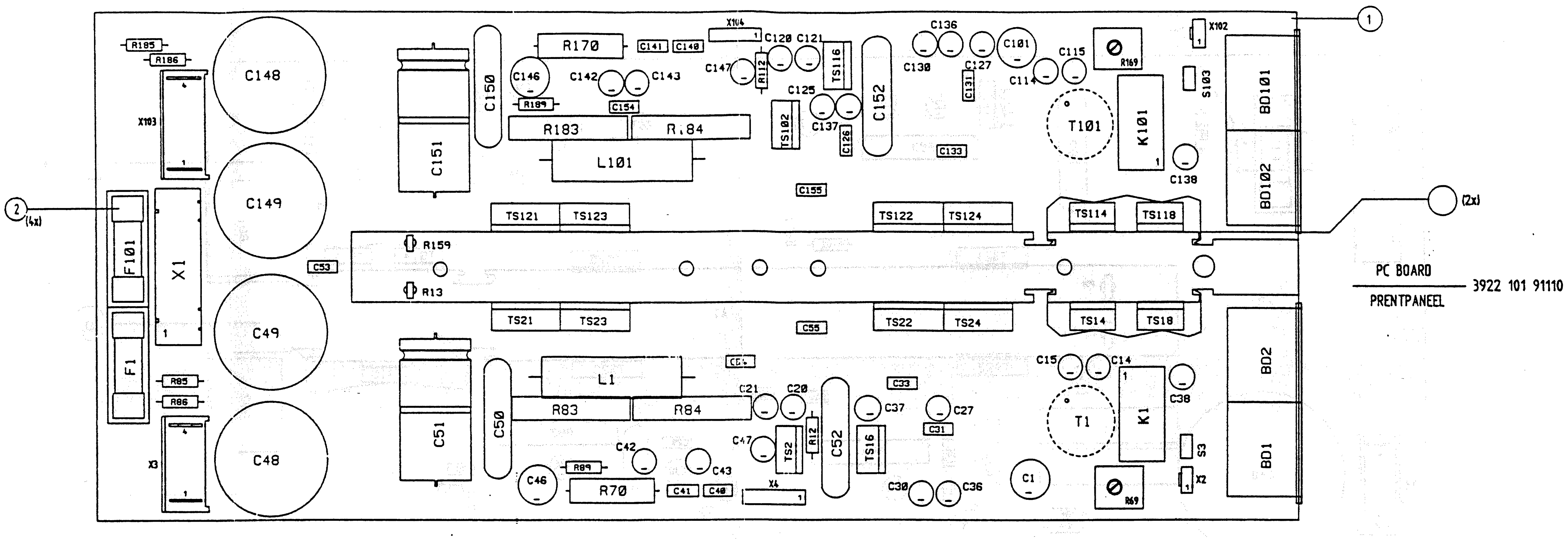
TOP VIEW

3922 101 91120 PRENTPANEEL
PRINTED BOARD

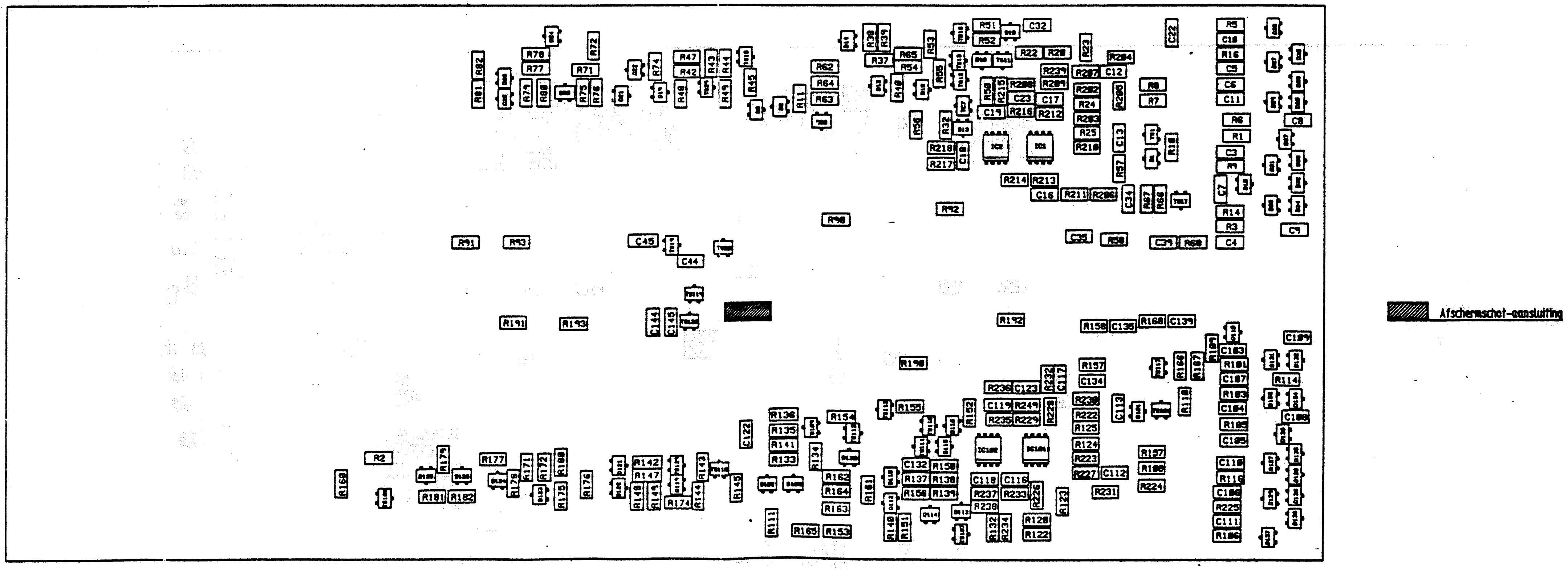

R81
R82
D24
D26
D25
R77
R78
R80
R104
R74
R135
R136
TS29
D22
R107
R119
D12
R123
TS15
R133
R33
R11
R34
R35
R36
TS3
R61
R40
D11
R53
R54
R52
R37
R55
R38
R39
R51
R50
C32
R49
R32
R42
TS6
R66
R67
C39
R68
TS17
D32
D31
C9
R1
R9
C7
C4
R3
R14
D20
R62
R101
R63
R64
TS20
C44
R90
R92
R94
R96
R58
C35
R91
R93
TS14
C45
R95
R97
R57
C34
R56
R60
R65
R5
C3
C5
C6
R6
D27
D28
D37
D38
D29
D30
D33
D36
C11
C2
R121
C12
C10
R119
C13
R120
R117
R118
R132
C16
R115
R125
R112
R111
R113
IC1
R22
R122
R123
R23
R23
C17
R124
R116
R127
C19
R126
R128
IC2
R7
R8
R10
D1
R130
R131
C18
C8
R111
D2
D3
R76
R75
D23
R71
R72
D21

BOTTOM VIEW

FIGURE 1, PAGE 8
Version B
PCB COMPONENT LAYOUT 1 X 100W MODULE

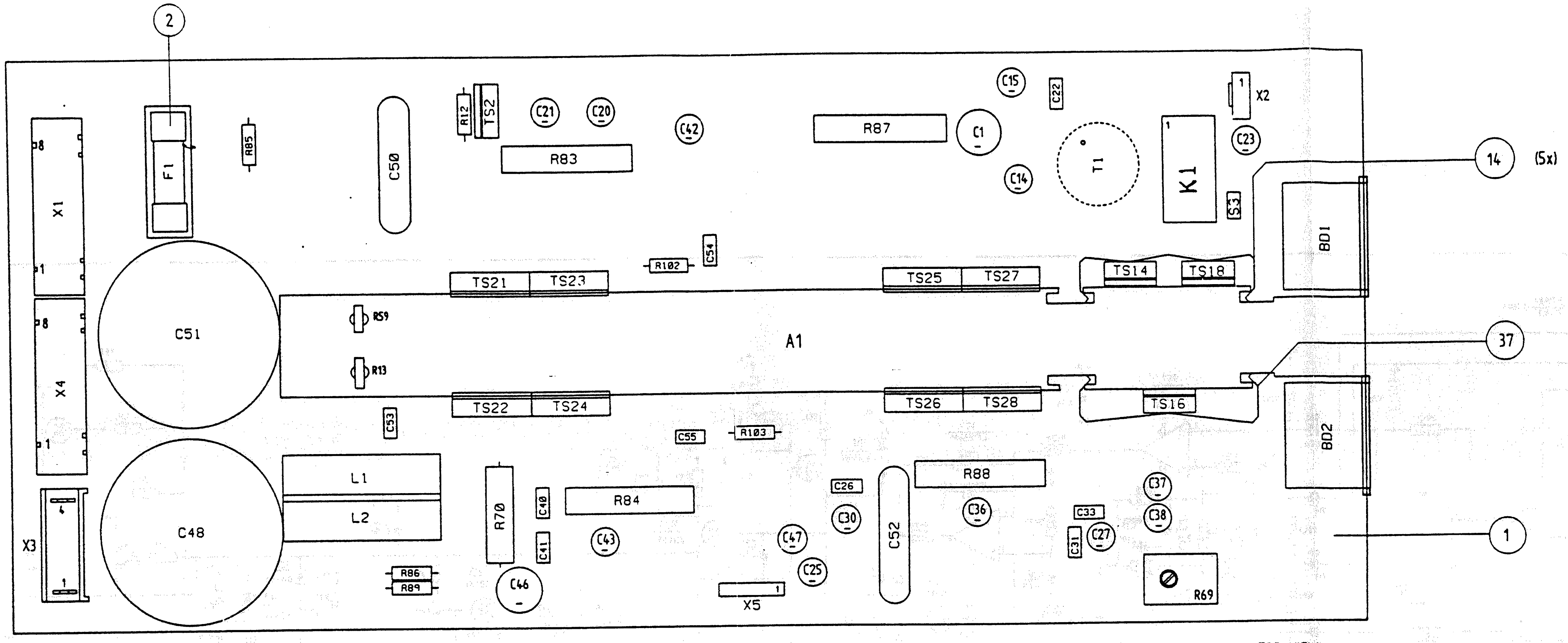

①
②
(4x)
(2x)
PC BOARD
PRENTPANEEL
3922 101 91110
R185
R186
X103
C148
C149
C49
C48
F101
X1
F1
R85
R86
X3
C53
C151
C150
C51
C50
R170
C141
C140
X104
C146
R189
C142
C143
C154
R183
R184
L101
L1
R83
R84
C147
R112
C120
C121
TS116
C125
TS102
C137
C126
C152
C136
C130
C127
C131
C133
C101
C115
C114
R169
T101
K101
C138
X102
S103
BD101
BD102
C155
TS121
TS123
TS122
TS124
TS114
TS118
R159
R13
TS21
TS23
TS22
TS24
TS14
TS18
C55
C54
C33
C21
C20
C37
C27
C31
C47
TS2
R12
C52
TS16
C42
C43
R89
C46
R70
C41
C40
X4
C30
C36
C1
C15
C14
C38
T1
K1
S3
X2
R69
BD2
BD1

TOP VIEW


Afschermschot-aansluiting

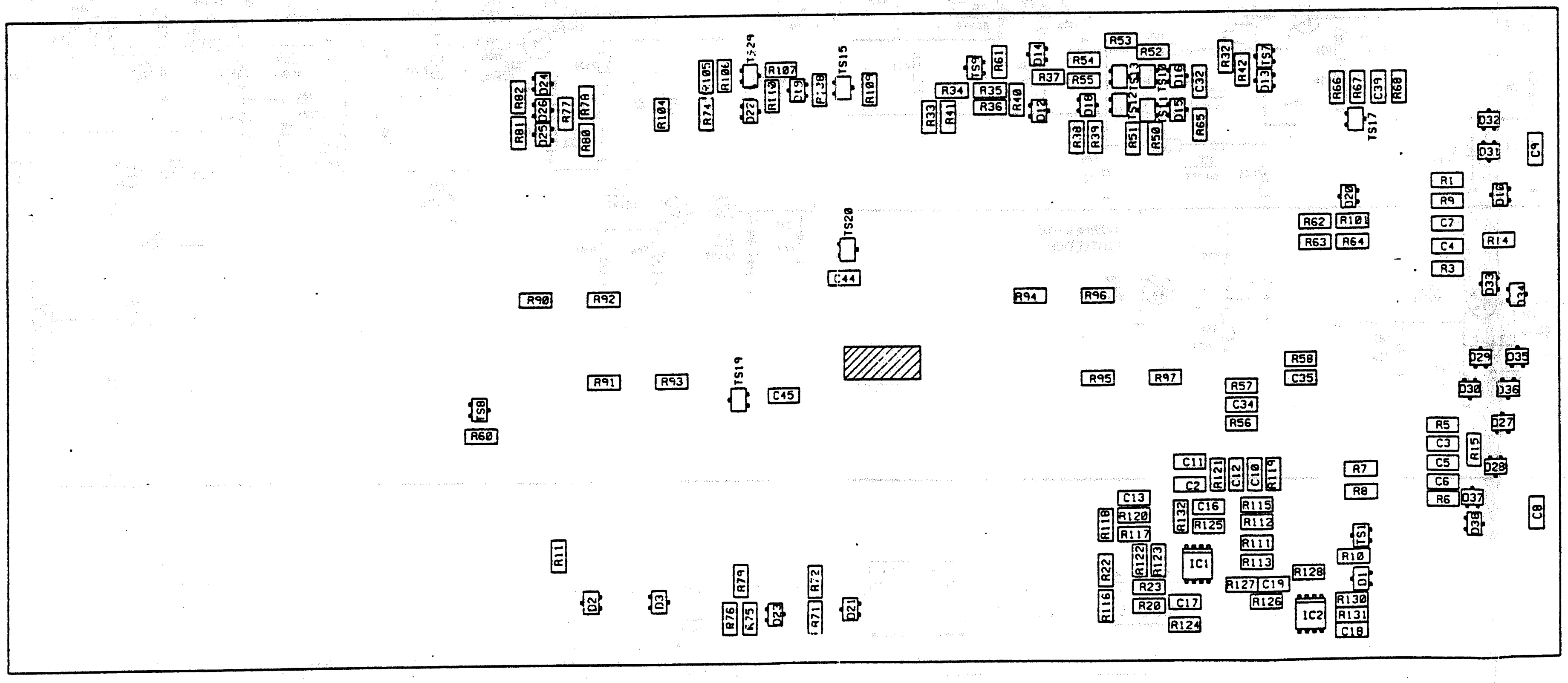
BOTTOM VIEW

FIGURE 2, PAGE 9
Version B
PCB COMPONENT LAYOUT 2 X 100W MODULE


2
14
(5x)
37
1
X1
X4
X3
F1
R85
C50
R12
TS2
C21
C20
C42
R83
R87
C15
C22
C1
C14
T1
K1
X2
C23
S3
BD1
BD2
C51
C48
R59
R13
A1
TS21
TS23
TS22
TS24
TS25
TS27
TS26
TS28
TS14
TS18
TS16
R102
C54
C53
C55
R103
L1
L2
R70
C40
C41
R84
C43
C46
R86
R89
X5
C47
C25
C26
C30
C52
R88
C36
C33
C31
C27
C37
C38
R69

TOP VIEW

3922 101 91120 PRENTPANEEL
PRINTED BOARD


R81
R82
R77
R78
R80
R104
R74
R105
R106
TS29
R107
R108
TS15
R109
R33
R41
R34
R35
R36
R40
R61
R37
R53
R52
R54
R55
R38
R39
R51
R50
R32
R42
R65
R66
R67
C39
R68
TS17
D32
D31
C9
R1
R9
C7
C4
R3
R14
R62
R101
R63
R64
TS20
C44
R90
R92
R94
R96
D33
D29
D35
D30
D36
D27
D28
D37
D39
R91
R93
TS19
C45
R95
R97
R58
C35
R57
C34
R56
TS8
R60
R5
C3
C5
C6
R6
R15
C8
C11
C2
R121
C12
C10
R119
R7
R8
C13
R120
R117
R118
R132
C16
R125
R115
R112
R111
R113
R116
R22
R122
R123
IC1
R23
R20
C17
R124
R128
R127
C19
R126
IC2
R10
D1
TS1
R130
R131
C18
R11
D2
D3
R79
R76
R75
R71
D21

BOTTOM VIEW

FIGURE 3, PAGE 10
Version B
PCB COMPONENT LAYOUT 1 X 200W MODULE

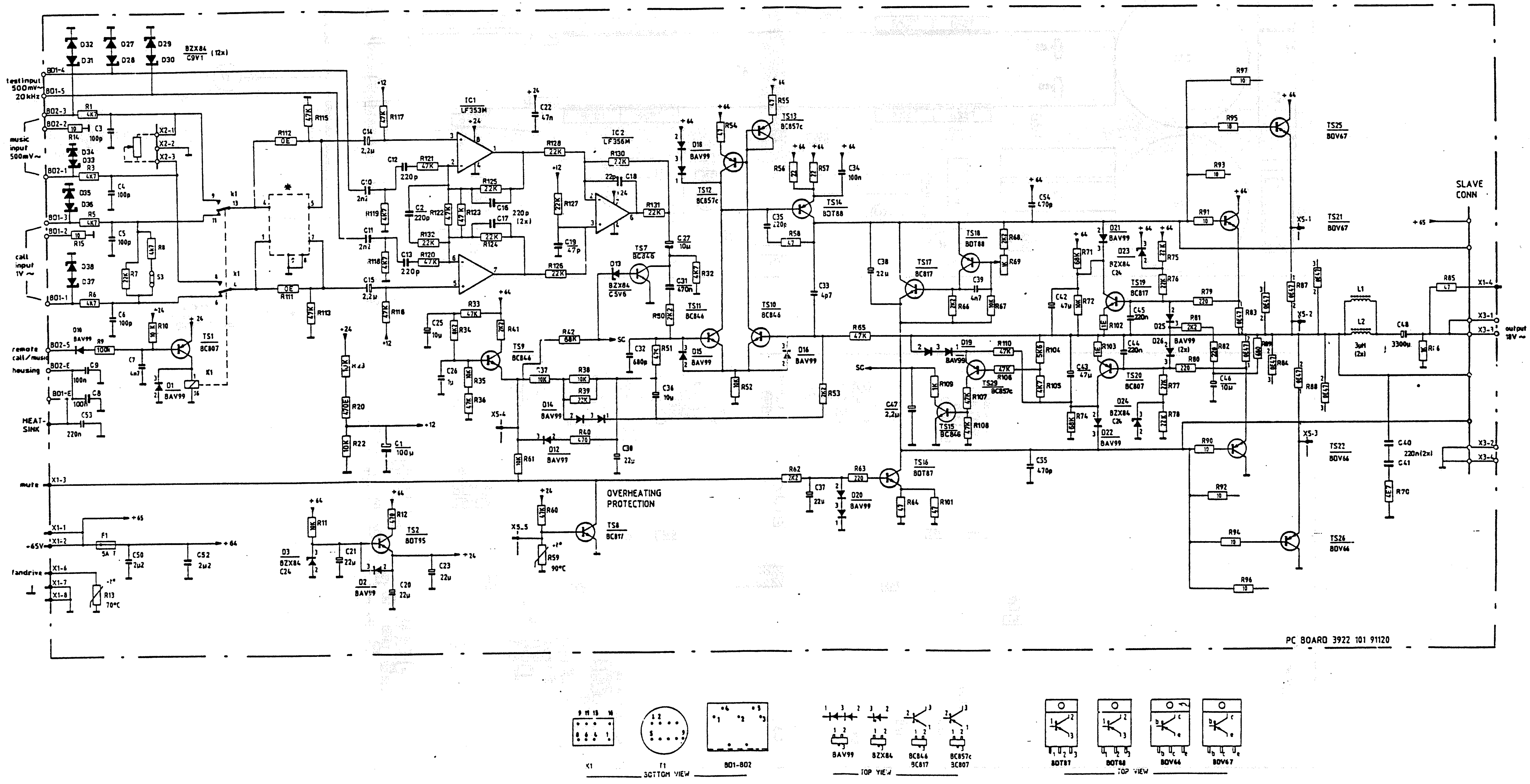

test input 500mV~ 20kHz
music input 500mV~
call input 1V ~
remote call/music
housing
HEAT-SINK
mute
-65V
fandrive
BZX84 C9V1 (12x)
IC1 LF353M
IC2 LF356M
TS1 BC807
TS2 BDT95
TS7 BC846
TS8 BC817
TS9 BC846
TS10 BC846
TS11 BC846
TS12 BC857c
TS13 BC857c
TS14 BDT88
TS15 BC846
TS16 BDT87
TS17 BC817
TS18 BDT88
TS19 BC817
TS20 BC807
TS21 BDV67
TS22 BDV66
TS25 BDV67
TS26 BDV66
TS29 BC857c
OVERHEATING PROTECTION
SLAVE CONN
output 18V ~
L1
L2 3µH (2x)
C48 3300µ
PC BOARD 3922 101 91120
K1
T1
BOTTOM VIEW
BD1-BD2
BAV99
BZX84
BC846 BC817
BC857c BC807
TOP VIEW
BDT87
BDT88
BDV66
BDV67

FIGURE 4, PAGE 11
Version B
CIRCUIT DIAGRAM 1 X 100W MODULE

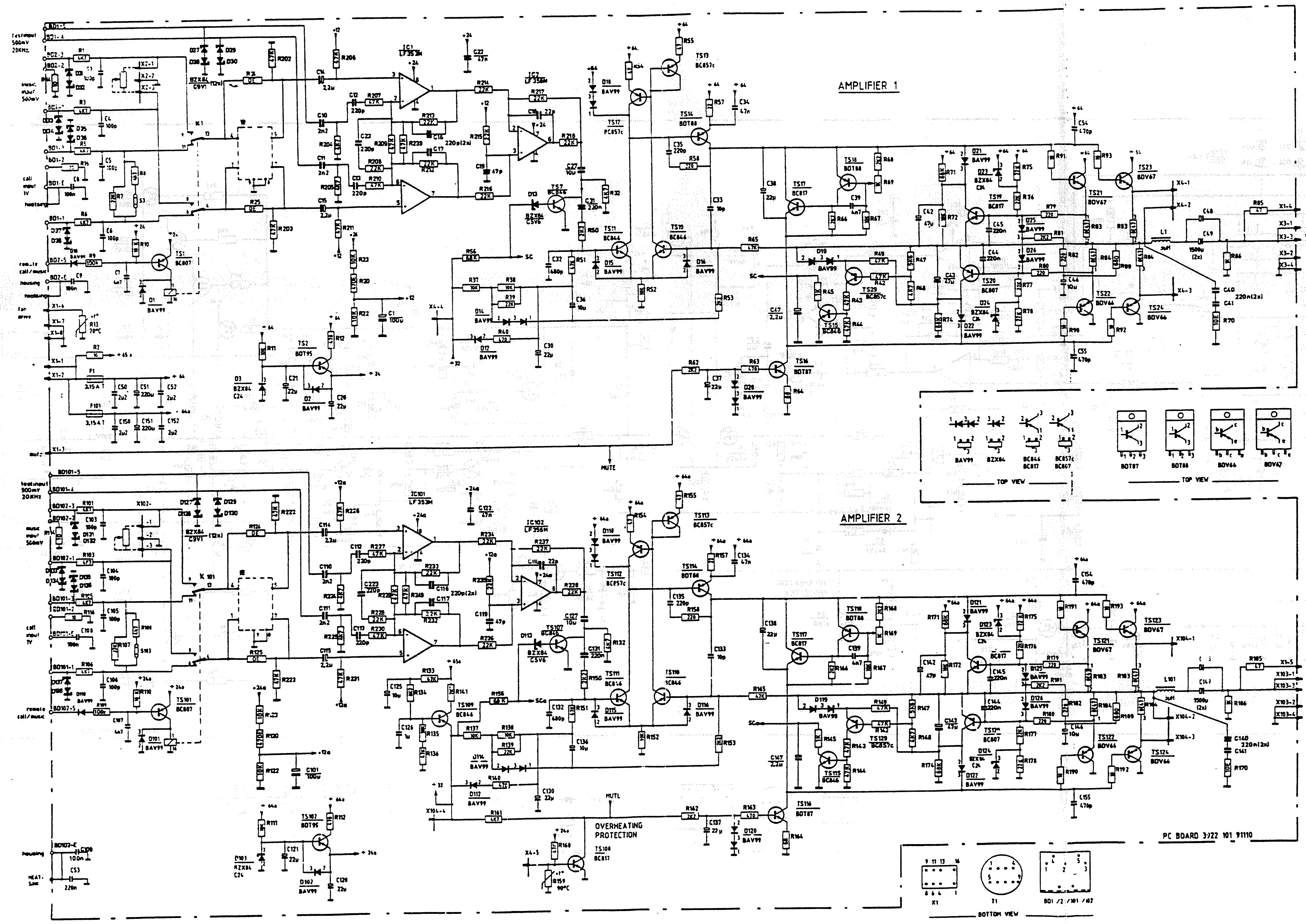

AMPLIFIER 1
AMPLIFIER 2
test input 500mV 20KHz
music input 500mV
call input 1V
remote call/music
housing
fan drive
mute
MUTE
IC1 LF353N
IC2 LF356N
IC101 LF353N
IC102 LF356N
output 18V~
OVERHEATING PROTECTION
TS104 BC817
R159 90°C
R13 70°C
BAV99
BZX84
BC846 BC817
BC857c BC867
BDT87
BDT88
BDV66
BDV67
TOP VIEW
K1
T1
BD1 /2 /101 /102
BOTTOM VIEW
PC BOARD 3322 101 91110
HEAT-SINK

FIGURE 5, PAGE 12
Version B
CIRCUIT DIAGRAM 2 X 100W MODULE

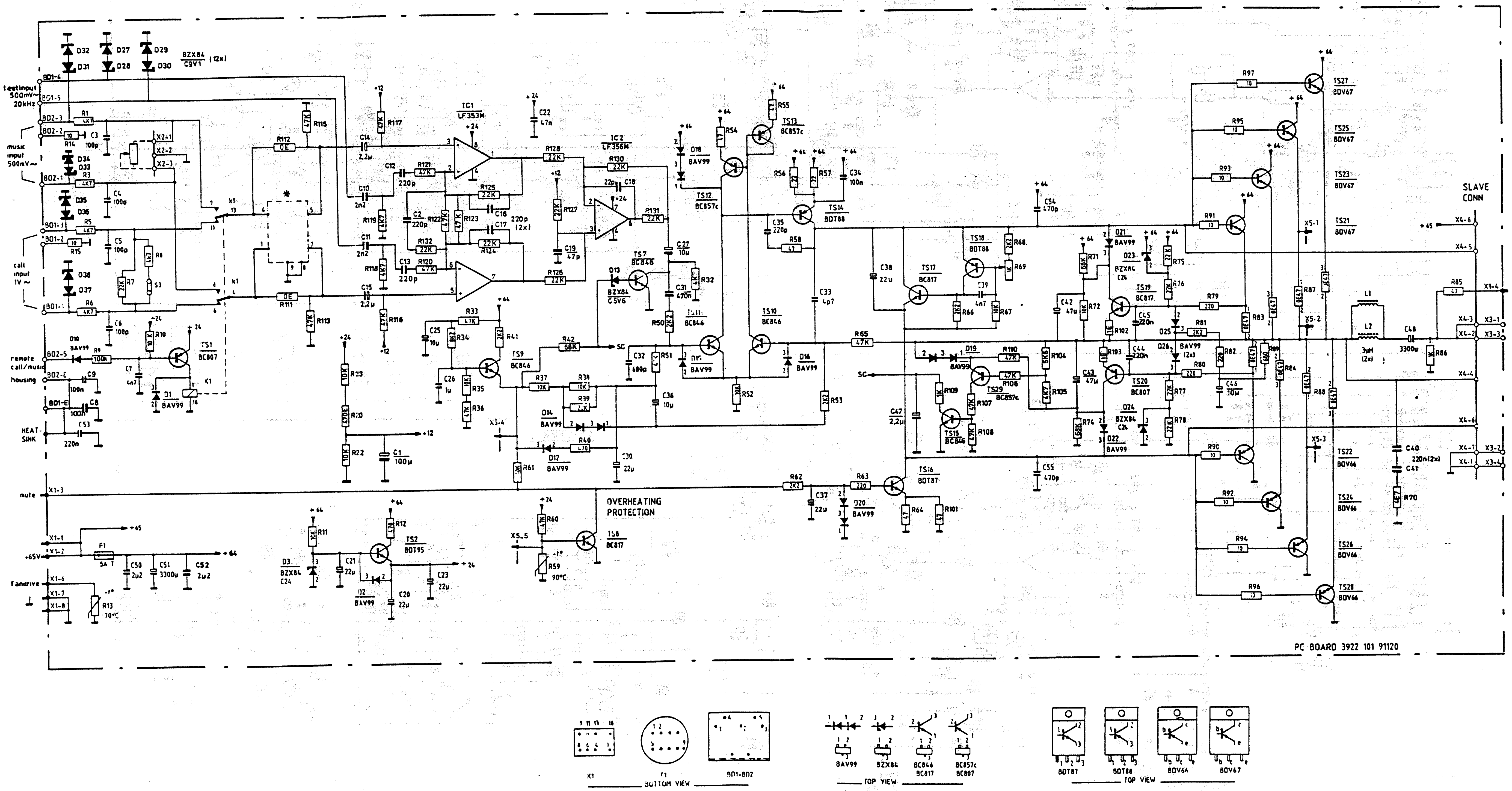

testinput 500mV~ 20kHz
music input 500mV~
call input 1V~
remote call/music
housing
HEAT-SINK
mute
+65V
fandrive
BZX84 C9V1 (12x)
IC1 LF353M
IC2 LF356M
TS1 BC807
TS2 BDT95
TS7 BC846
TS8 BC817
TS9 BC846
TS10 BC846
TS11 BC846
TS12 BC857c
TS13 BC857c
TS14 BDT88
TS15 BC846
TS16 BDT87
TS17 BC817
TS18 BDT88
TS19 BC817
TS20 BC807
TS21 BDV67
TS22 BDV66
TS23 BDV67
TS24 BDV66
TS25 BDV67
TS26 BDV66
TS27 BDV67
TS28 BDV66
TS29 BC857c
OVERHEATING PROTECTION
SLAVE CONN
output 18V~
PC BOARD 3922 101 91120
X1
F1
BOTTOM VIEW
BD1-BD2
BAV99
BZX84
BC846 BC817
BC857c BC807
TOP VIEW
BDT87
BDT88
BDV66
BDV67

FIGURE 6, PAGE 13
Version B
CIRCUIT DIAGRAM 1 X 200W MODULE

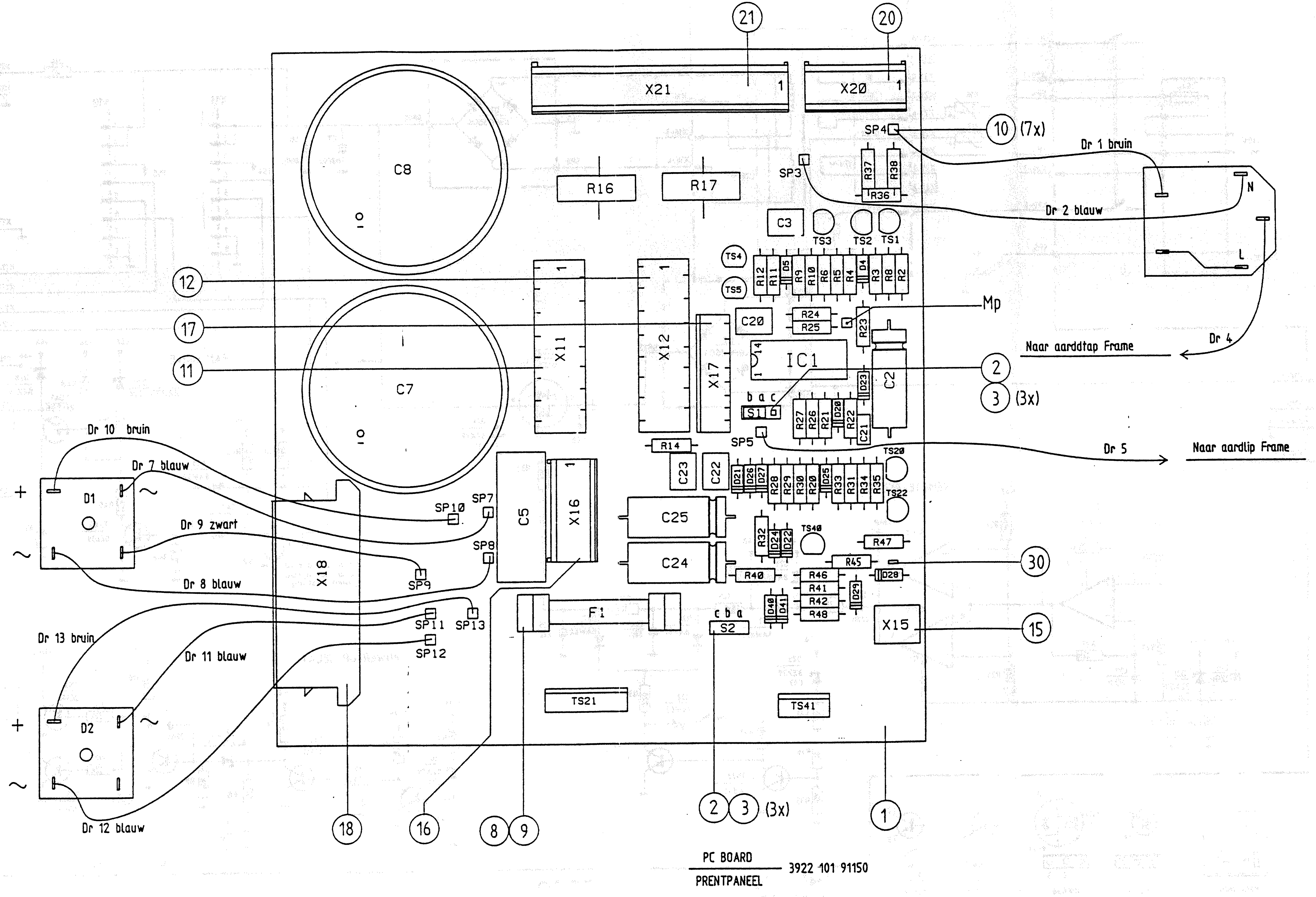

21
20
X21
X20
1
10 (7x)
SP4
SP3
Dr 1 bruin
Dr 2 blauw
N
L
R37
R38
R36
R16
R17
C8
C3
TS3
TS2
TS1
TS4
TS5
R12
R11
D5
R9
R10
R6
R5
R4
D4
R3
R8
R2
12
17
11
X11
X12
X17
C20
R24
R25
R23
Mp
Naar aarddtap Frame
Dr 4
IC1
14
C2
D23
2
3 (3x)
C7
b a c
S1
R27
R26
R21
D20
R22
C21
SP5
Dr 5
Naar aardlip Frame
R14
C23
C22
D21
D26
D27
R28
R29
R30
R20
D25
R33
R31
R34
R35
TS20
TS22
Dr 10 bruin
Dr 7 blauw
D1
+
~
SP10
SP7
C5
X16
Dr 9 zwart
SP8
SP9
X18
C25
C24
R32
D24
D22
TS40
R47
R45
30
R40
R46
R41
R42
R48
D28
D29
D40
D41
Dr 8 blauw
F1
SP11
SP13
SP12
c b a
S2
X15
15
Dr 13 bruin
Dr 11 blauw
D2
TS21
TS41
Dr 12 blauw
18
16
8
9
2
3 (3x)
1
PC BOARD
PRENTPANEEL
3922 101 91150

FIGURE 7, PAGE 14

PCB COMPONENT LAYOUT POWER SUPPLY MODULE (VERSION C D)

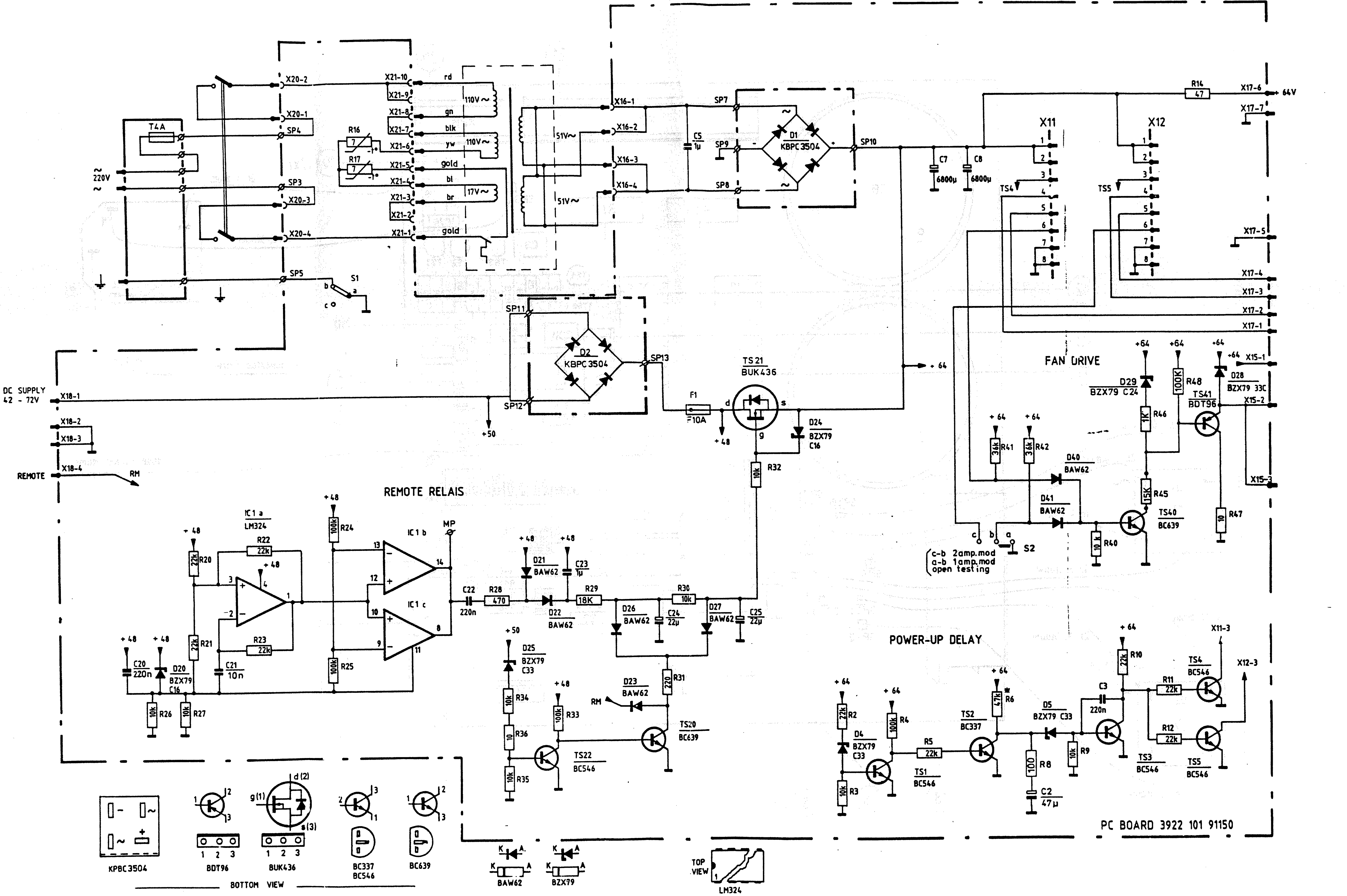
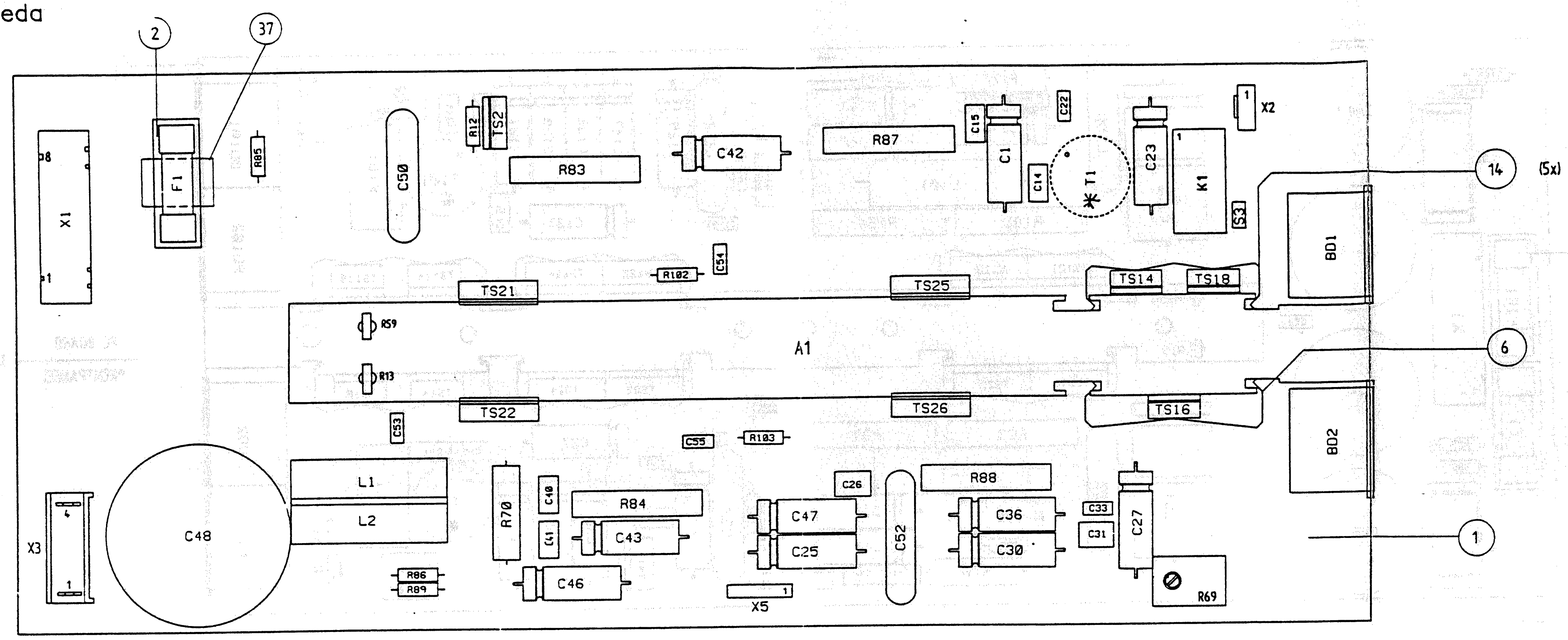

T4A
220V
X20-2
X20-1
SP4
SP3
X20-3
X20-4
SP5
S1
X21-10
X21-9
X21-8
X21-7
X21-6
X21-5
X21-4
X21-3
X21-2
X21-1
R16
R17
rd
gn
blk
yw
gold
bl
br
110V~
17V~
51V~
X16-1
X16-2
X16-3
X16-4
C5
1µ
SP7
SP9
SP8
D1
KBPC3504
SP10
C7
6800µ
C8
6800µ
X11
X12
TS4
TS5
R14
47
X17-6
64V
X17-7
X17-5
X17-4
X17-3
X17-2
X17-1
SP11
D2
KBPC3504
SP13
SP12
DC SUPPLY
42 - 72V
X18-1
X18-2
X18-3
REMOTE
X18-4
RM
+50
F1
F10A
TS21
BUK436
d
s
g
+48
D24
BZX79
C16
R32
10k
+64
FAN DRIVE
D29
BZX79 C24
R48
100K
R46
1K
TS41
BDT96
D28
BZX79 33C
X15-1
X15-2
X15-3
R41
36k
R42
36k
D40
BAW62
D41
BAW62
R45
15K
TS40
BC639
R47
10
R40
10k
S2
c-b 2amp.mod
a-b 1amp.mod
open testing
REMOTE RELAIS
IC1 a
LM324
R22
22k
R20
22k
R21
22k
R23
22k
C20
220n
D20
BZX79
C16
R26
10k
R27
10k
C21
10n
R24
100k
R25
100k
IC1 b
IC1 c
MP
C22
220n
R28
470
D21
BAW62
D22
BAW62
C23
1µ
R29
18K
R30
10k
D26
BAW62
C24
22µ
D27
BAW62
C25
22µ
D25
BZX79
C33
R34
10k
R36
10
R35
10k
R33
100k
TS22
BC546
D23
BAW62
R31
220
TS20
BC639
POWER-UP DELAY
R2
22k
D4
BZX79
C33
R3
10k
TS1
BC546
R4
100k
R5
22k
TS2
BC337
R6
47k
D5
BZX79 C33
R8
100
C2
47µ
R9
10k
C3
220n
R10
22k
R11
22k
R12
22k
TS4
BC546
TS3
BC546
TS5
BC546
X11-3
X12-3
PC BOARD 3922 101 91150
KPBC3504
BDT96
BUK436
BC337
BC546
BC639
BOTTOM VIEW
BAW62
BZX79
TOP VIEW
LM324

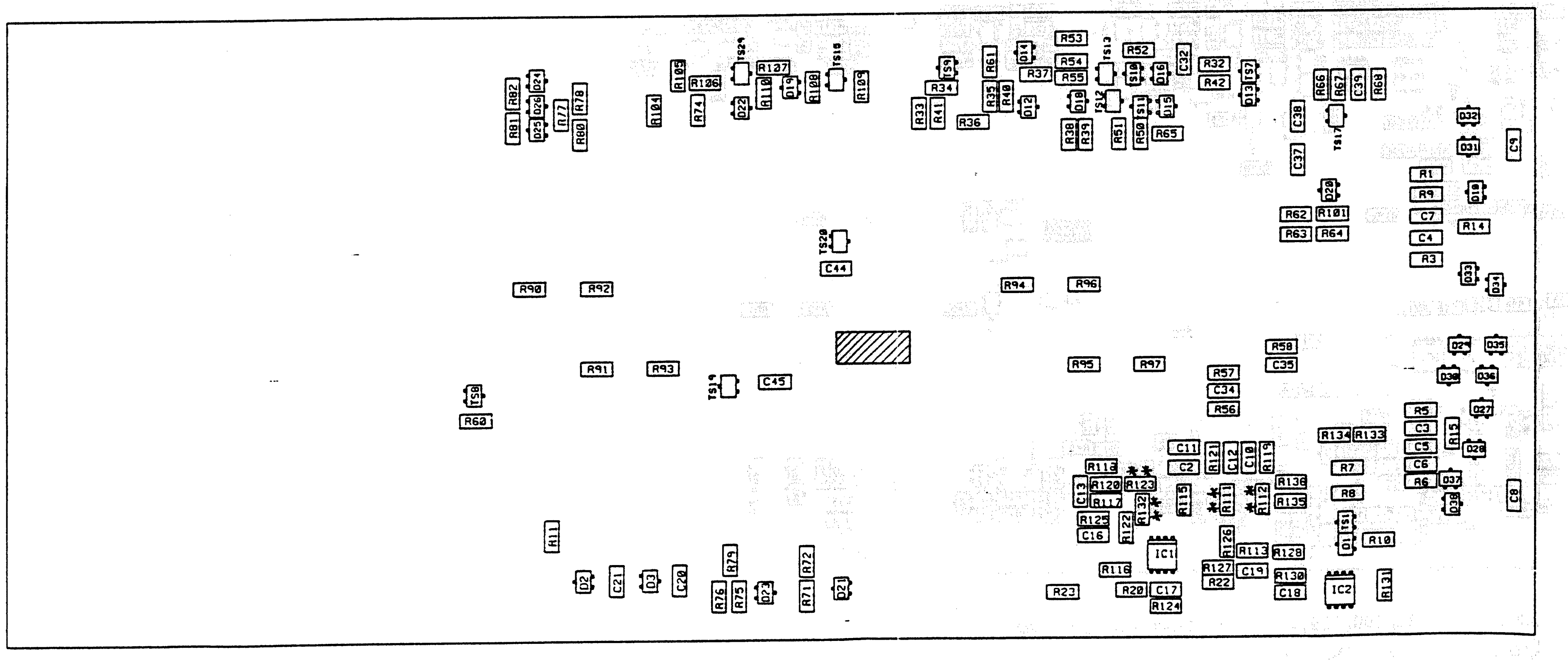
FIGURE 8, PAGE 15

CIRCUIT DIAGRAM POWER SUPPLY MODULE (VERSION C, D)


2
37
14
(5x)
6
1
X1
F1
R85
C50
R12
TS2
R83
C42
R87
C15
C1
C14
T1
C22
C23
K1
X2
S3
BD1
R102
C54
TS21
TS25
TS14
TS18
R59
R13
A1
TS22
TS26
TS16
C53
C55
R103
BD2
L1
L2
C48
X3
R70
C40
C41
R84
C43
C46
R86
R89
C26
C47
C25
C52
R88
C36
C30
C33
C31
C27
R69
X5

TOP VIEW

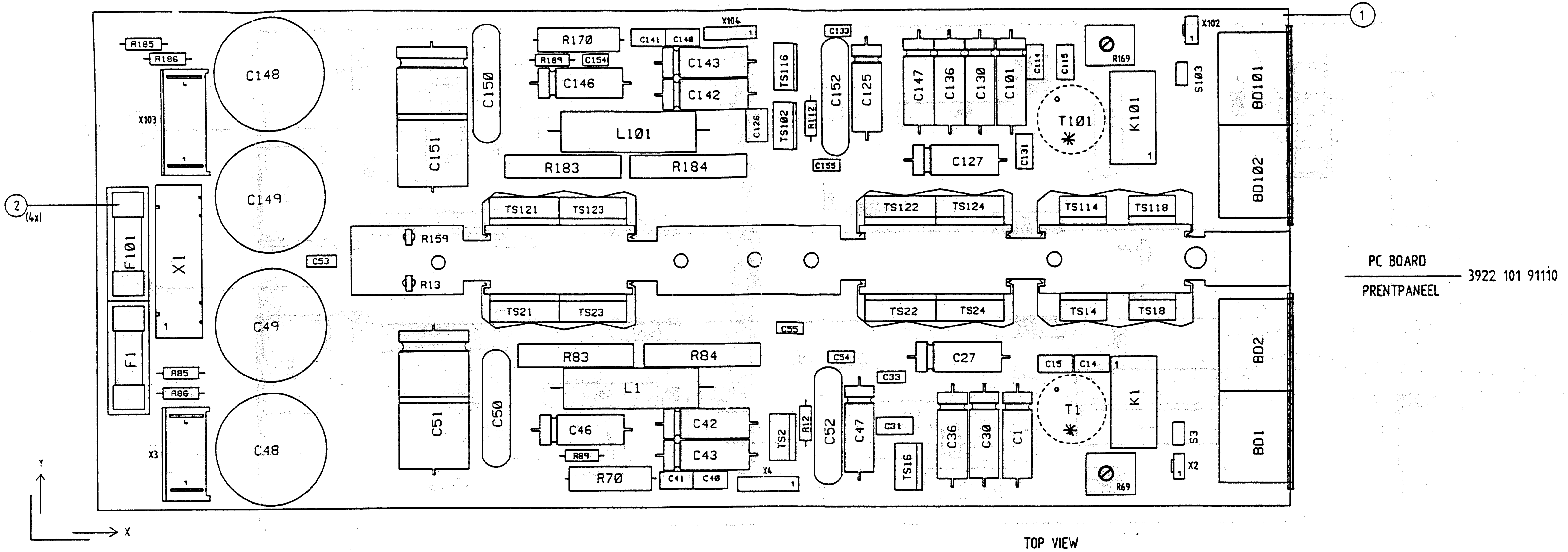
3922 101 91120 PRENTPANEEL
PRINTED BOARD


R81
R82
R77
R78
R80
R104
R105
R74
R106
TS29
R107
R110
R108
TS18
R109
R33
R34
R41
R36
R35
R40
R61
R53
R54
R55
R37
R52
C32
R32
R42
R38
R39
R51
R50
R65
R66
R62
C39
R60
C38
C37
TS17
C9
R1
R9
C7
C4
R3
R14
R62
R101
R63
R64
TS20
C44
R90
R92
R94
R96
R91
R93
TS19
C45
R95
R97
R58
C35
R57
C34
R56
TS8
R68
R134
R133
R5
C3
C5
C6
R6
R15
C11
C2
R121
C12
C10
R119
R118
R120
R123
R117
C13
R132
R115
R111
R112
R136
R135
R7
R8
C8
R125
C16
R122
IC1
R126
R113
R128
R10
R116
R127
C19
R130
R22
C18
IC2
R131
R23
R20
C17
R124
R11
C21
C20
R79
R76
R75
R72
R71

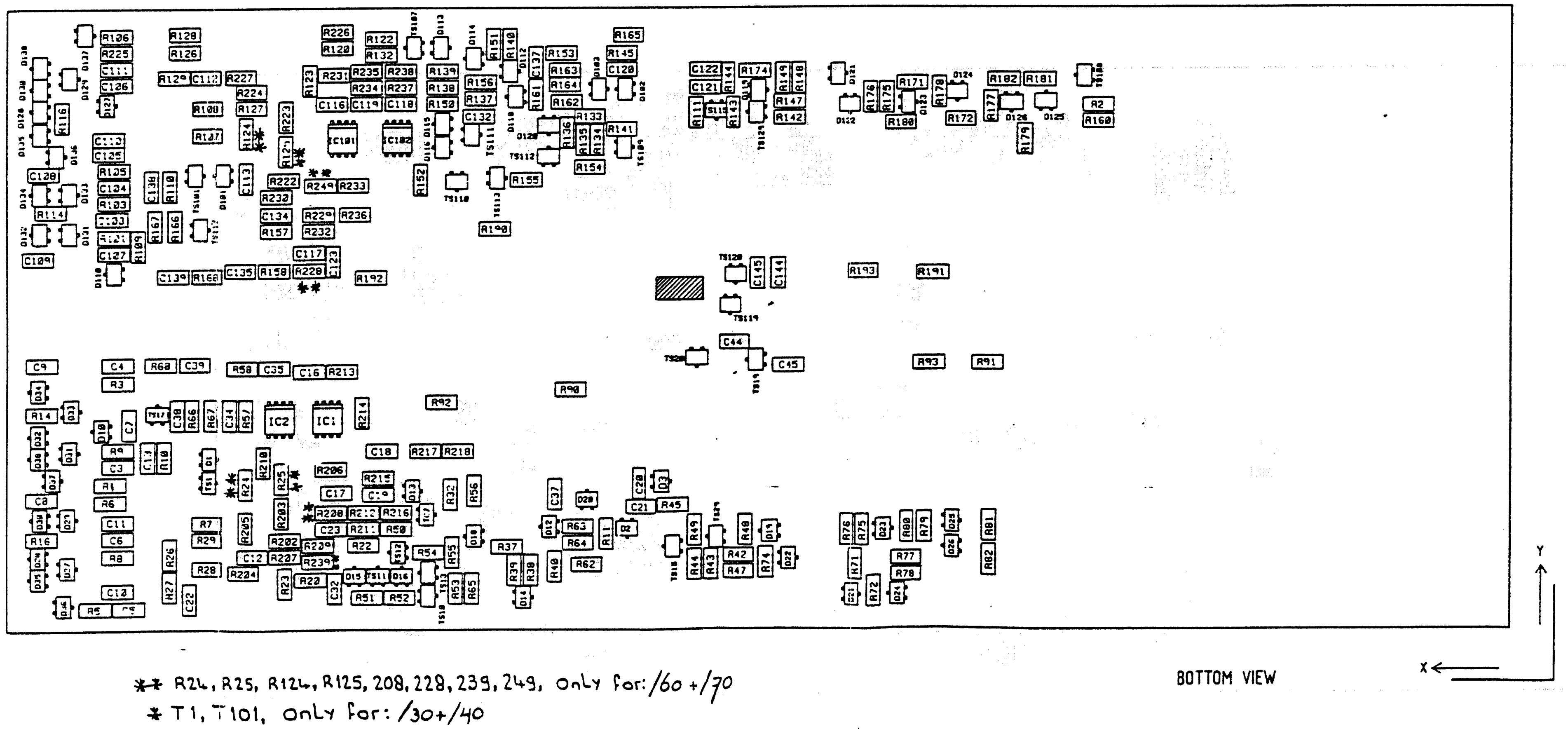
BOTTOM VIEW

** R111, R112, R123, R132, only for: /60+/70
* T1, only for: /30+/40

FIGURE 9, PAGE 16
version C, D
PCB COMPONENT LAYOUT 1 X 100W MODULE


①
②
(4x)
PC BOARD
PRENTPANEEL
3922 101 91110
R185
R186
C148
C149
C49
C48
X103
X3
X1
F101
F1
R85
R86
C151
C150
C51
C50
R170
R189
C154
C146
C141
C140
C143
C142
X104
L101
R183
R184
TS116
TS102
R112
C126
C133
C152
C125
C155
C147
C136
C130
C101
C114
C115
C127
C131
R169
T101
K101
X102
S103
BD101
BD102
TS121
TS123
TS122
TS124
TS114
TS118
R159
R13
C53
TS21
TS23
TS22
TS24
TS14
TS18
C55
R83
R84
L1
C46
R89
R70
C41
C40
C42
C43
X4
TS2
R12
C52
C47
C54
C33
C31
C27
TS16
C36
C30
C1
C15
C14
T1
K1
S3
X2
R69
BD2
BD1
Y
X

TOP VIEW

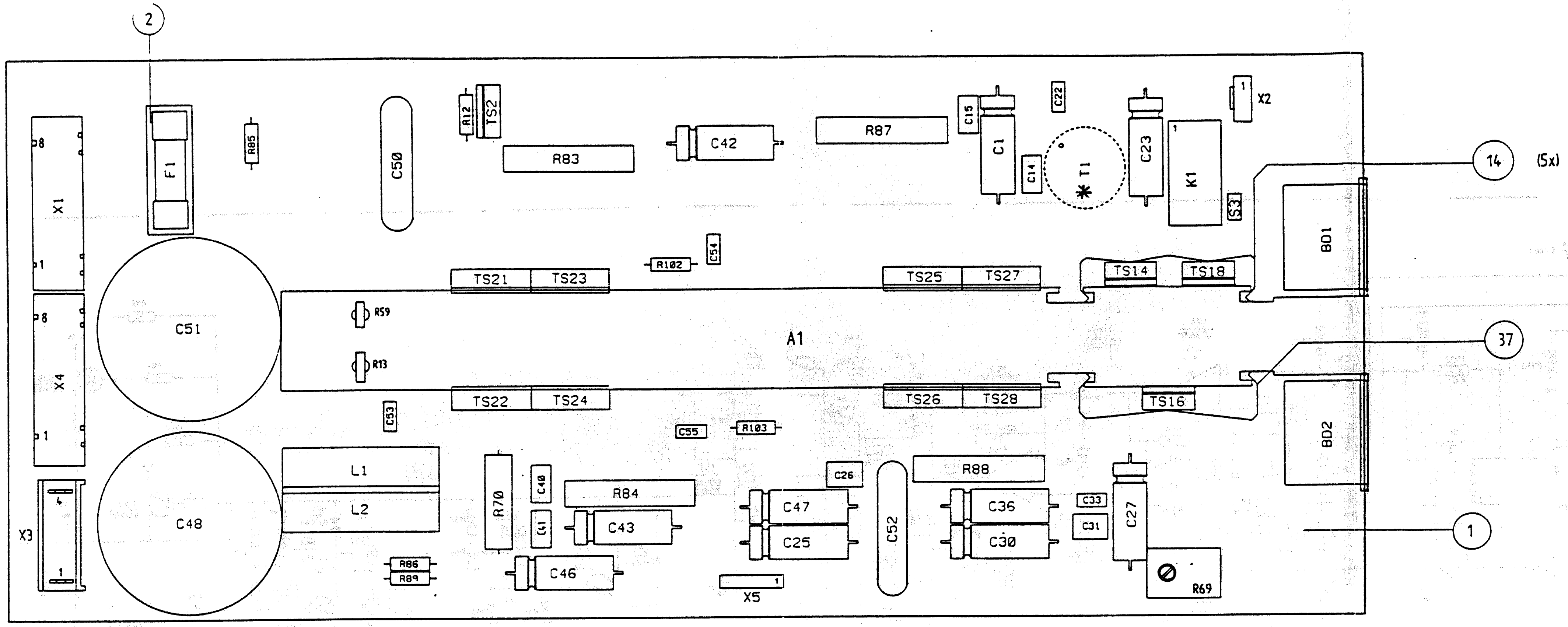

IC101
IC102
IC2
IC1
Y
X

BOTTOM VIEW

** R24, R25, R124, R125, 208, 228, 239, 249, only for: /60 + /70

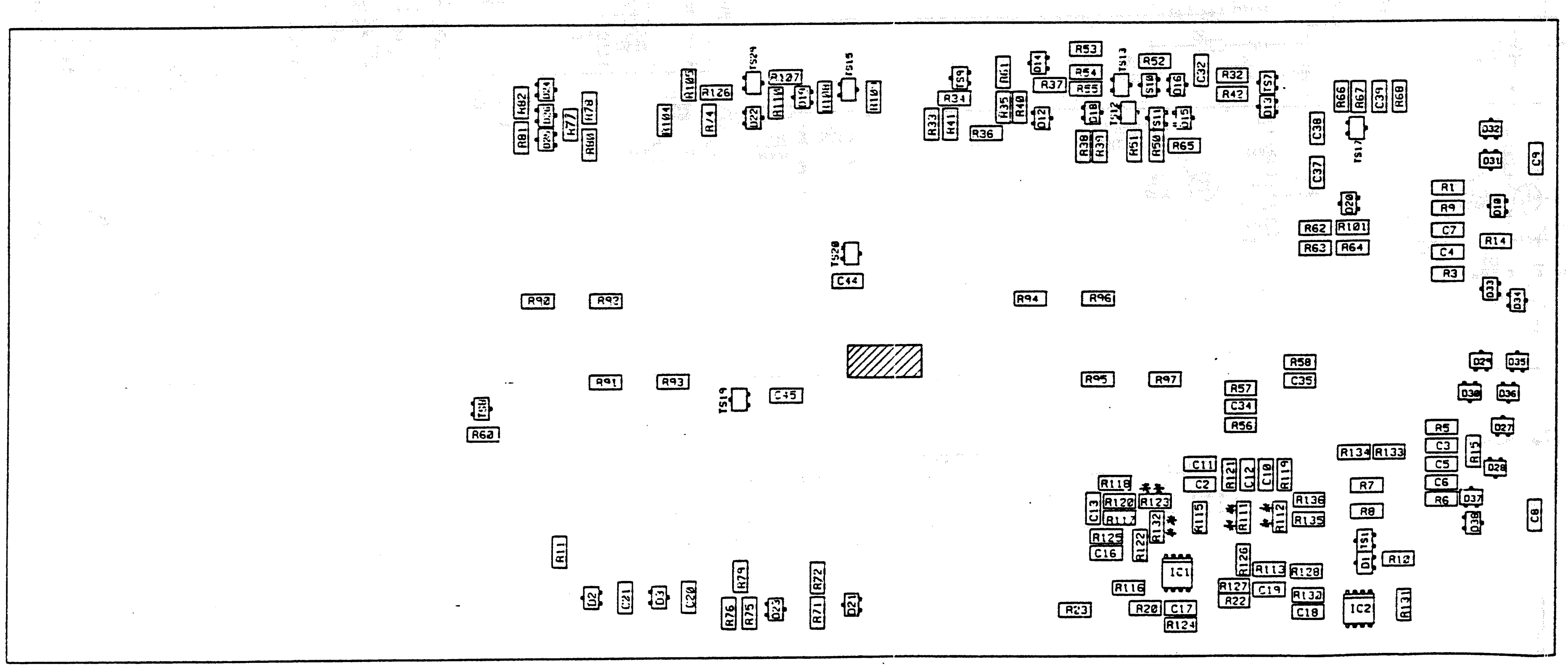
* T1, T101, only for: /30 + /40

FIGURE 10, PAGE 17
Version C, D
PCB COMPONENT LAYOUT 2 X 100W MODULE


2
X1
8
1
X4
8
1
X3
1
F1
R85
C50
R12
TS2
R83
C42
R87
C15
C1
C14
T1
✱
C22
C23
K1
X2
1
S3
14
(5x)
BD1
C51
C48
R102
C54
TS21
TS23
TS25
TS27
TS14
TS18
R59
R13
A1
37
TS22
TS24
TS26
TS28
TS16
BD2
C53
C55
R103
L1
L2
R70
C40
C41
R84
C43
C26
C47
C25
C52
R88
C36
C30
C33
C31
C27
1
R69
R86
R89
C46
X5

TOP VIEW

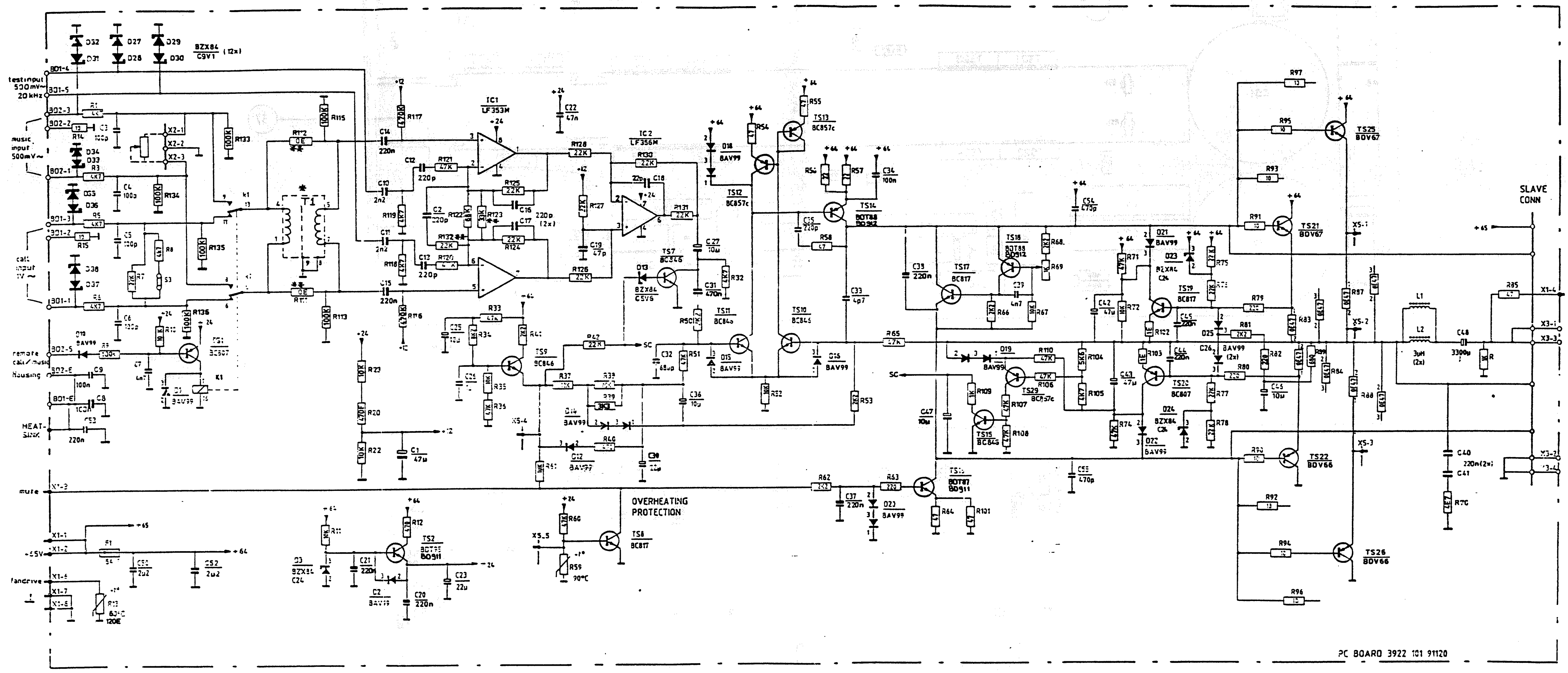
3922 101 91120 PRENTPANEEL / PRINTED BOARD


R81
R82
R77
R78
R80
R104
R105
R126
R74
R127
R110
R108
R109
R107
TS29
TS15
R33
R41
R34
R36
R35
R40
R61
R53
R54
R55
R37
R52
R39
R51
R50
R65
R32
R42
C32
C38
C37
R66
R67
C39
R68
D32
D31
C9
R1
R9
C7
C4
R3
R14
R62
R101
R63
R64
TS20
C44
R92
R93
R94
R96
R91
R93
C45
TS19
R95
R97
R58
C35
R57
C34
R56
R60
R134
R133
R5
C3
C5
C6
R6
C11
C2
R118
R120
R123
R13
R117
R125
C16
R122
R115
R111
R112
R136
R135
R7
R8
R12
IC1
R116
R20
C17
R124
R23
R127
R22
C19
R113
R128
R130
C18
IC2
R131
C8
R11
C21
C20
R79
R76
R75
R72
R71

BOTTOM VIEW

✱✱ R111, R112, R123, R132, Only for: /60+/70
✱ T1. Only for: /30+/40

PCB COMPONENT LAYOUT 1 X 200W MODULE


testinput 500mV~ 20kHz
BO1-4
BO1-5
BO2-3
BO2-2
music input 500mV~
BO2-1
BO1-3
BO1-2
call input 1V~
BO1-1
remote call/music
BO2-5
Housing
BO2-6
BO1-6
HEAT-SINK
mute
+45V
fandrive
BZX84 C9V1 (12x)
IC1 LF353M
IC2 LF356M
TS7 BC846
TS9 BC846
TS11 BC846
TS10 BC846
TS12 BC857c
TS13 BC857c
TS14 BDT88 BD912
TS17 BC817
TS18 BDT88 BD912
TS19 BC817
TS20 BC807
TS21 BDV67
TS22 BDV66
TS25 BDV67
TS26 BDV66
TS29 BC857c
TS15 BC843
TS16 BDT87 BD911
TS2 BDT87 BD911
TS8 BC817
OVERHEATING PROTECTION
SLAVE CONN
output 13V~
X1-4
X3-1
X3-3
X3-2
X3-4
X5-1
X5-2
X5-3
X5-4
X5-5
L1
L2
3µH (2x)
C48 3300µ
C40 220n(2x)
C41
PC BOARD 3922 101 91120

** R111. R112. R123. R132. Only for: /60+/70
* T1. Only for: /30+/70

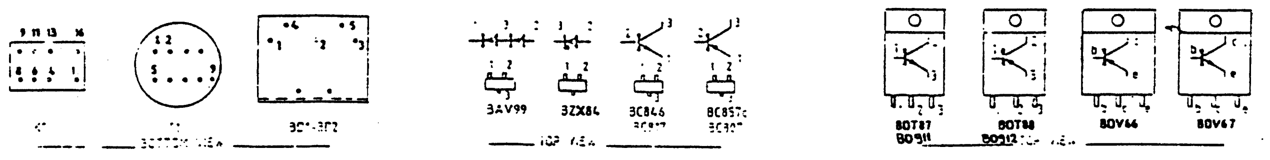
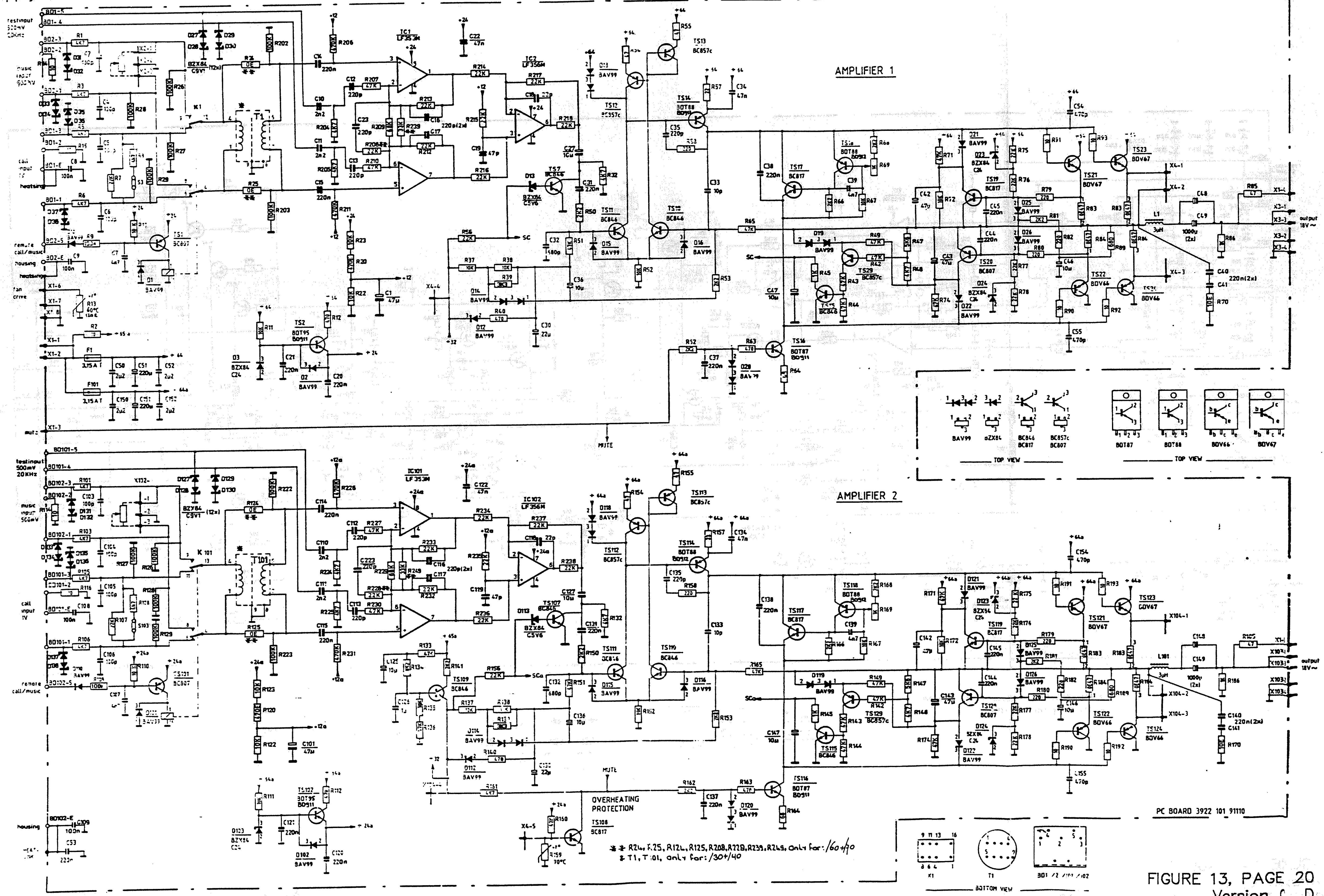
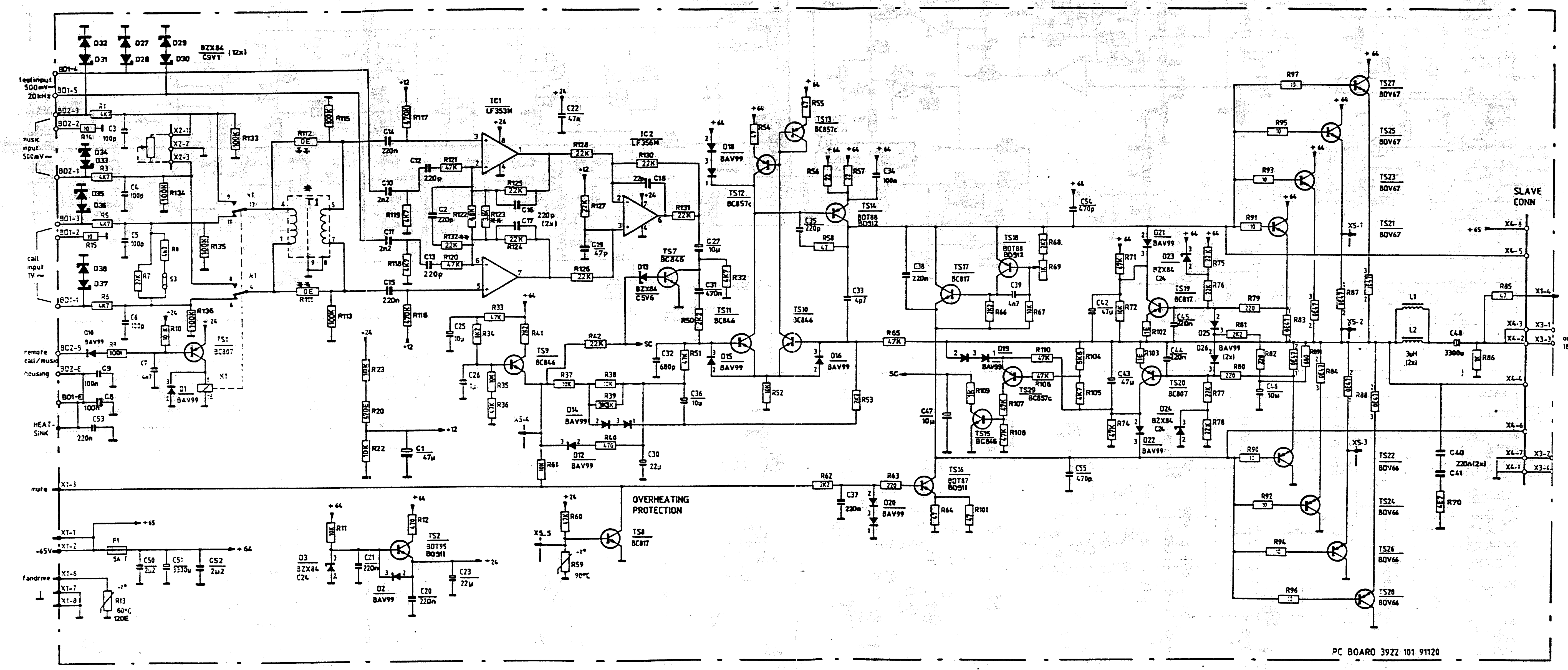

K1
T1
BOTTOM VIEW
BO1-BO2
BAV99
BZX84
BC846 BC817
BC857c BC807
TOP VIEW
BDT87 BD911
BDT88 BD912
BDV66
BDV67

FIGURE 12, PAGE 19
Version C, D
CIRCUIT DIAGRAM 1 X 100W MODULE


AMPLIFIER 1
AMPLIFIER 2
testinput 500mV 20KHz
music input 500mV
call input 1V
heatsink
remote call/music
housing
fan drive
mute
MUTE
output 18V~
IC1 LF353M
IC2 LF356M
IC101 LF353M
IC102 LF356M
T1
T101
K1
K101
L1 3uH
L101 3uH
F1 3,15A T
F101 3,15A T
TS7 BC846
TS11 BC846
TS12 BC857c
TS13 BC857c
TS14 BDT88 BD912
TS16 BDT87 BD911
TS17 BC817
TS18 BDT88 BD912
TS19 BC817
TS20 BC807
TS21 BDV67
TS22 BDV66
TS23 BDV67
TS24 BDV66
TS29 BC857c
TS107 BC846
TS108 BC817
TS109 BC846
TS111 BC846
TS112 BC857c
TS113 BC857c
TS114 BDT88 BD912
TS116 BDT87 BD911
TS117 BC817
TS118 BDT88 BD912
TS119 BC817
TS121 BDV67
TS122 BDV66
TS123 BDV67
TS124 BDV66
TS129 BC857c
OVERHEATING PROTECTION
BAV99
BZX84
BC846 BC817
BC857c BC807
BDT87
BDT88
BDV66
BDV67
TOP VIEW
K1
T1
BO1 /2 /101 /102
BOTTOM VIEW
PC BOARD 3922 101 91110

* * R24, R25, R124, R125, R208, R228, R239, R249, Only for: /60+/70
* T1, T101, only for: /30+/40

FIGURE 13, PAGE 20
Version C, D
CIRCUIT DIAGRAM 2 X 100W MODULE


BZX84 C5V1 (12x)
D32 D31 D27 D28 D29 D30
testinput 500mV~ 20kHz
music input 500mV~
call input TV~
remote call/music
housing
HEAT-SINK
mute
fandrive
801-4
801-5
802-3
802-2
802-1
801-3
801-2
801-1
802-5
802-6
801-6
IC1 LF353M
IC2 LF356M
R112 0E
R111 0E
TS1 BC807
TS2 BDT95 BD911
TS7 BC846
TS8 BC817
TS9 BC846
TS10 BC846
TS11 BC846
TS12 BC857c
TS13 BC857c
TS14 BDT88 BD912
TS15 BC846
TS16 BDT87 BD911
TS17 BC817
TS18 BDT88 BD912
TS19 BC817
TS20 BC807
TS29 BC857c
TS21 BDV67
TS23 BDV67
TS25 BDV67
TS27 BDV67
TS22 BDV66
TS24 BDV66
TS26 BDV66
TS28 BDV66
OVERHEATING PROTECTION
R59 90°C
R13 60°C 120E
F1 5A T
L1
L2 3µH (2x)
C48 3300µ
SLAVE CONN
output 18V~
X1-1
X1-2
X1-3
X1-6
X1-7
X1-8
X3-1
X3-2
X3-3
X3-4
X4-1
X4-2
X4-3
X4-4
X4-5
X4-6
X4-7
X4-8
X5-1
X5-2
X5-3
X5-5
+65
-65V
+64
+24
-24
+12
-12
PC BOARD 3922 101 91120

** R111, R112, R123, R132, Only for: /60+/70
* T1, only for: /30+/40

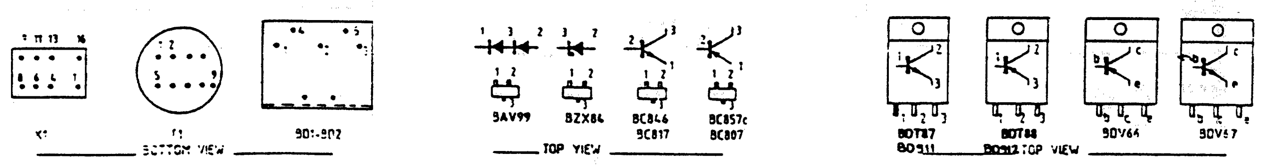

K1
T1
BOTTOM VIEW
801-802
BAV99
BZX84
BC846
BC817
BC857c
BC807
TOP VIEW
BDT87
BD911
BDT88
BD912
BDV66
BDV67
TOP VIEW

FIGURE 14, PAGE 21
Version C, D
CIRCUIT DIAGRAM 1 X 200W MODULE

8.6 Service Information : 4822 861 05045

PHILIPS

Service Information

Communication & Security Systems

Date	:	1 November 1993
Category	:	Modification
Article group	:	SAG 6100 Customer Support Supply Centre - Breda
Product	:	SQ 45 Amplifiers
Service Manual	:	4822 733 24397
Reason	:	Decrease of reliability due to high ambient temperatures when SQ45 amplifiers are mounted in 19 " racks.
Contents	:	See contents list (page 2)

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2	CORRECTIVE ACTION IN THE FIELD		3
3	DIFFERENT VERSIONS OF /30 AND /40 AMPLIFIERS IN THE FIELD		4
4	MODIFICATION		5
5	MODIFICATION KITS		8
6	DIAGRAMS		9
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	FIGURE 2	COMPONENT LAYOUT FOR MODIFICATION OF VERSION A 1x 200W MODULE	10
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3. DIFFERENT VERSIONS OF /30 AND /40 SQ45 AMPLIFIERS

3.1 BRIEF DESCRIPTIONS OF THE VERSIONS

Version A
This is the first supplied amplifier version equipped with an input transformer and asymmetrical input and 85° C capacitors on the amplifier PCB.

Version B
This is the amplifier version without input transformer mounted on the amplifier PCB, with a symmetrical input and with 105° C capacitors mounted.

Version C
The amplifier version without input transformer mounted on the PCB, with a symmetrical input and with 125° C capacitors mounted.

Version D
The amplifier version with input transformer mounted on the PCB, with a symmetrical input and with 125° C capacitors mounted.

3.2 SERIAL NUMBER OVERVIEW FOR THE DIFFERENT VERSIONS OF SQ45 AMPLIFIERS

All serial numbers mentioned are the first number of the range of that amplifier version.

See next page for the overview

1 PROBLEM DESCRIPTION

Problems with SQ 45 amplifiers can occur when more of these amplifiers are mounted in 19 " racks and a permanent 20 kHz surveillance mode is applied and/or a too high capacitive load is connected to the output of the amplifier.
Due to the additional power dissipation caused in this case, a temperature build up will take place in the amplifier.
This will, after some time, result in defective capacitors on the Power Amplifier modules. The capacitors have a limited lifetime at higher temperatures.

2. CORRECTIVE ACTION IN THE FIELD

To eliminate potential problems in the above type of installations, field modifications have to be carried out on a certain number of SQ45 amplifiers.
For a detailed overview of which units have to be modified, refer to the following paragraphs.
The modification can be carried out during preventive or corrective maintenance.
The modification can be divided into the following steps:

a. Modify the amplifier module.
b. Modify the power supply unit.

NOTE: It is essential that the SQ45 amplifiers are used within the specified ambient temperature. The maximum temperature is 55° C. Care has to be taken that the air inside the 19"cabinet is sufficiently cooled and the maximum permissible temperature is never exceeded.

SERIAL NUMBER OVERVIEW

Type-number	Version A	Version B	Version C	Version D
LBB 1342/30	600	653	664	667
LBB 1342/40	600	935	1062	1097
LBB 1343/30	600	626	636	638
LBB 1343/40	600	924	957	969
LBB 1344/30	600	778	846	855
LBB 1344/40	600	1623	1872	1908
LBB 1346/30	600	620	627	628
LBB 1346/40	600	1215	1462	1489
LBB 1347/30	600	665	670	671
LBB 1347/40	600	1450	1719	1848
LBB 1348/30	600	747	791	803
LBB 1348/40	600	3294	4055	4393

3.3 SQ 45 AMPLIFIERS THAT ARE ALREADY MODIFIED

All version C an D amplifiers are not subject to this modification.
The 200W slave amplifier in the LBB 1348/xx is not subject to this modification.

4 MODIFICATIONS

All modifications can be carried out by exchanging components.
After modification only a simple test is necessary to verify the functioning of the amplifier. This test is limited to comparing the input versus the output and using an oscilloscope to view the sine-wave.
The actual modification depends on the type of amplifier module and the version and is described in more details in the next paragraphs.

4.1 VERSION 'A' AMPLIFIERS

NOTE: Following components must be changed / added to modify the version 'A' amplifier modules and power supply module (85° C capacitors).
For serial number identification refer to paragraph 3.2.

Version 'A' -> 1 x 100W and 1 x 200W module:

C14, C42, C43 : 47uF/40V (125°C)
C25, C36, C46 : 10uF/63V "
C30 : 22uF/63V "
C10, C16, C23 : 1uF
C20, C21, C37, C38 : 220nF
R13 : PTC 60°C
R89 (add) : 680E (MRS25)

Version 'A' -> 2 x 100W module:

C51, C151 : 220uF (125°C)
C42, C43, C142, C143,
C14, C114 : 47uF/40V "
C46, C146, C125, C36,
C136 : 10uF/63V "
C30, C130 : 22uF/63V "
C10, C110, C16, C116 : 1uF
C20, C21, C120, C121,
C37, C38, C137, C138 : 220nF
R13 : PTC, 60°C
R89, R189 (add) : 680E (MRS25)

Version 'A' -> Power supply module:

C2 : 47uF/40V (125°)
C24, C25 : 22uF/100V "
C20 : 220nF
R46 changed into D: BZX79B27

4.2 VERSION 'B' AMPLIFIERS

NOTE: Following components must be changed to modify the version 'B' amplifier modules (105° C capacitors) and power supply module (85°C capacitors).
For serial number identification refer to paragraph 3.2.

Version 'B' -> 1x 100W and 1x 200W module:

C1, C21, C42, C43 : 47uF/40V (125°C)
C25, C27, C36, C46, C47 : 10uF/63V "
C23, C30 : 22uF/63V "
C14, C15 : 1uF
C20, C37, C38 : 220nF
R13 : PTC, 60°C

Version 'B' -> 2x 100W module:

C1, C101, C21, C121,
C42, C43, C142, C143 : 47uF/40V (125°C)
C27, C127, C125, C36,
C136, C46, C146, C47, C147 : 10uF/63V "
C30, C130 : 22uF/63V "
C14, C114, C15, C115 : 1uF
C20, C120, C37, C137,
C38, C138 : 220nF
R13 : PTC 60°C

Version 'B' -> power supply module:

C2 : 47uF/40V (125°)
C24, C25 : 22uF/100V "
C20 : 220nF
R46 changed into D: BZX79B27

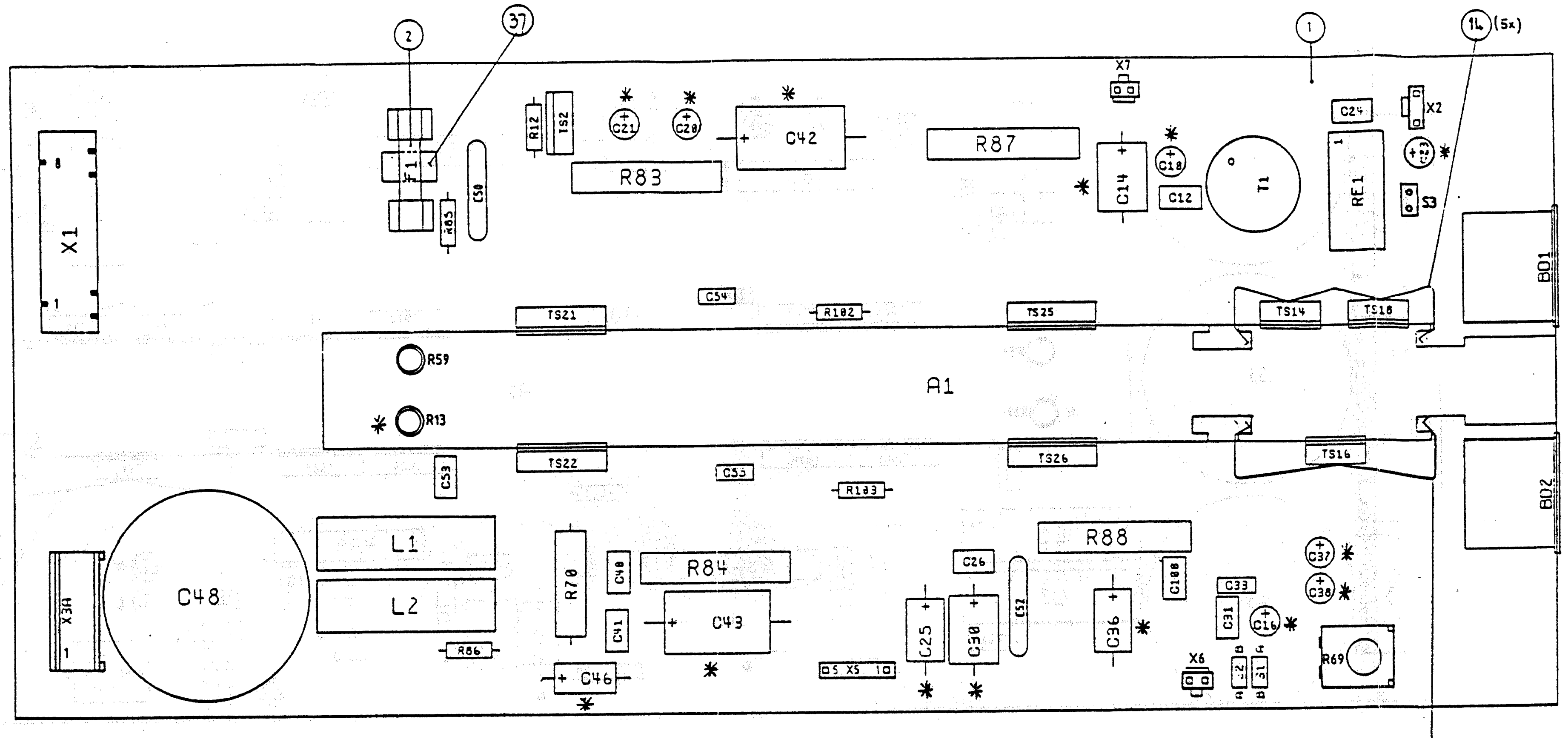
5 MODIFICATION KITS

The listed components in paragraph 4 are not available from Philips Consumer Service, but can be ordered as a complete modification kit from the Supply Centre - Breda (Logistics Dept.).

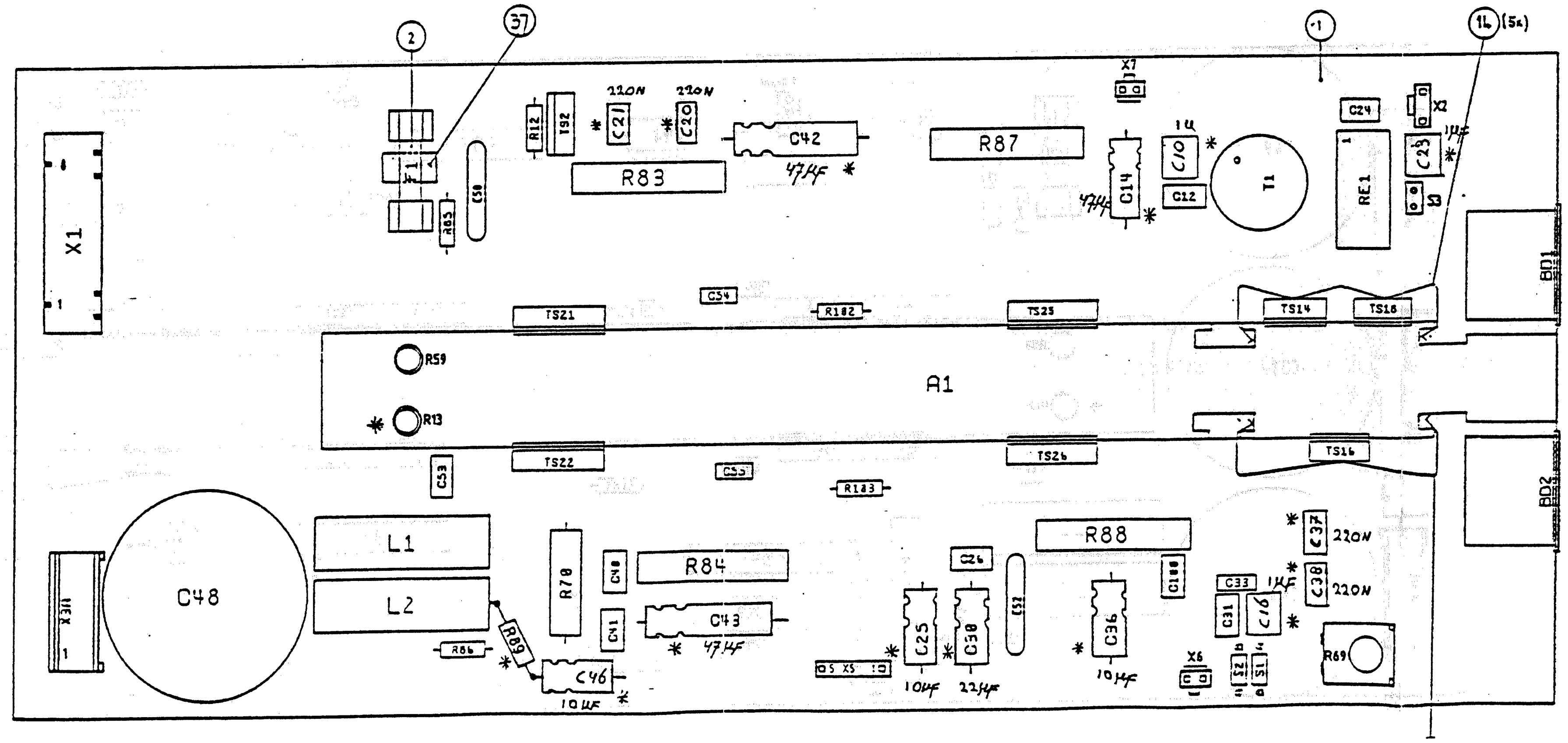
NOTE: These orders will be accepted till 01-03-1994 and will be delivered free of charge.

The ordering code number for the modification kits are as follows:

8993 932 00101	For the 1x 100W or 1x 200W PCB (version A or B).
8993 932 00111	For the 2x 100W PCB (version A or B).
8993 932 00121	For the power supply PCB (version A or B).

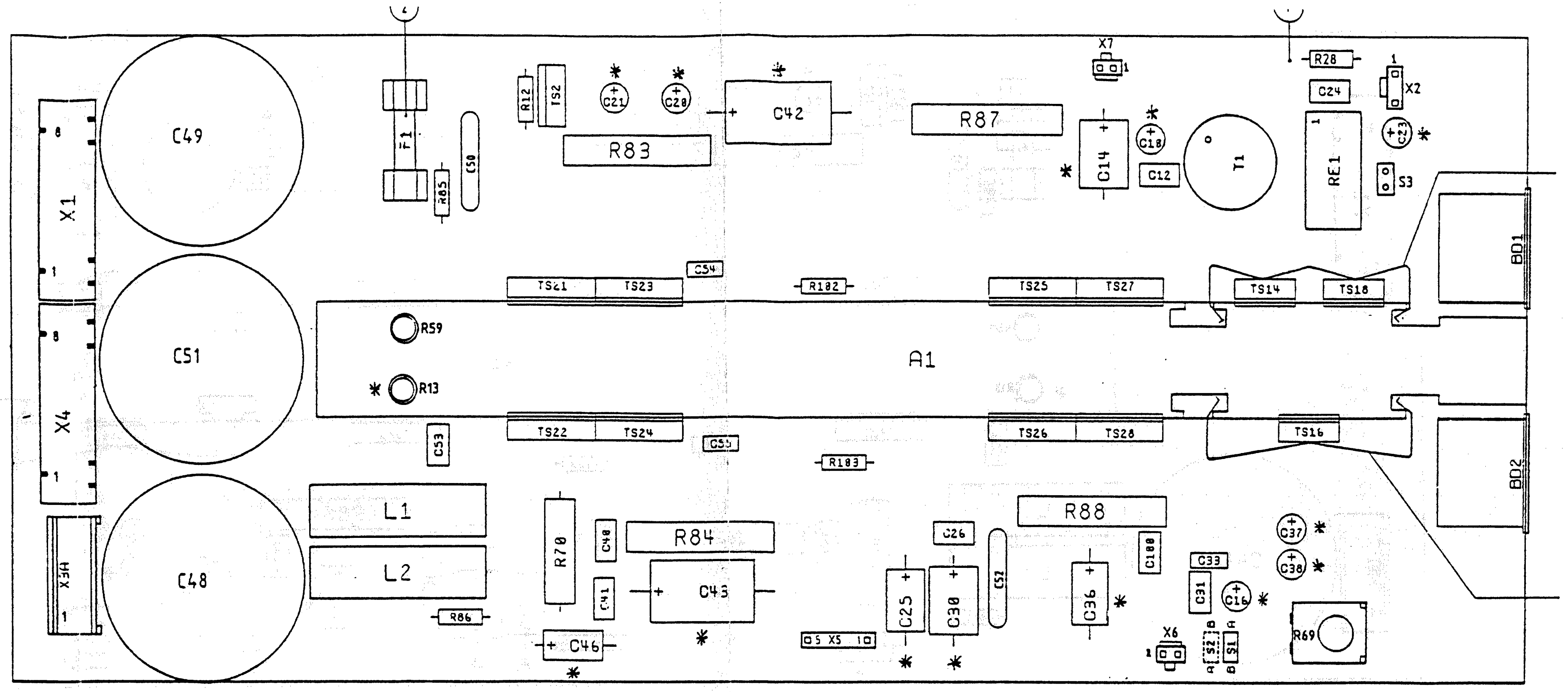

2
37
1
16 (5x)
X1
R12
TS2
C21
C20
C42
R83
F1
R85
C50
R87
X7
C14
C18
C12
T1
C24
X2
C23
RE1
S3
BD1
BD2
TS21
C54
R102
TS25
TS14
TS16
R59
R13
A1
TS22
C55
R103
TS26
TS16
C53
X3A
C48
L1
L2
R70
C40
C41
R84
C43
C46
R86
X5
C26
C25
C30
C52
R88
C100
C36
C33
C31
C16
C37
C38
X6
S2
S1
R69

* Delete component

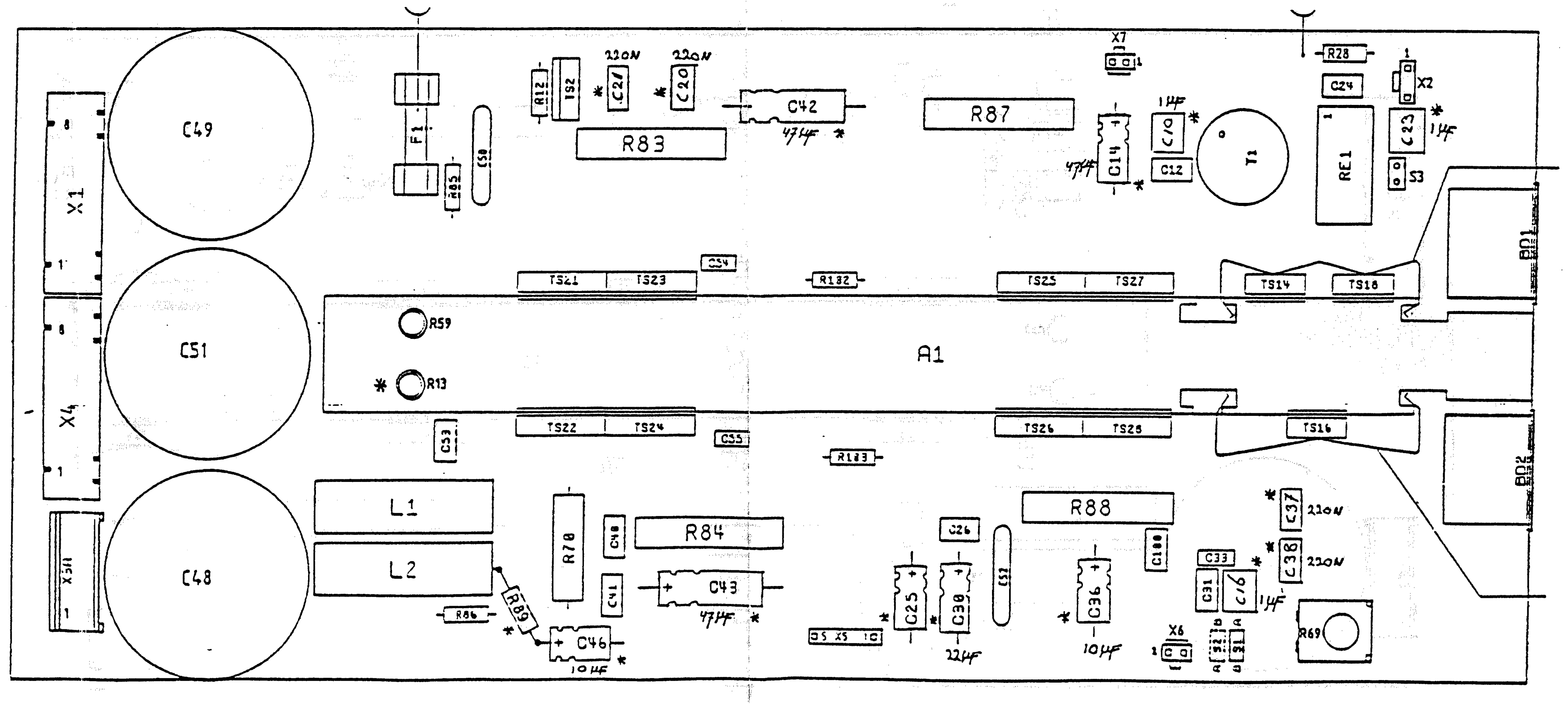

2
37
1
16 (5x)
X1
R12
TS2
220N
220N
C21
C20
C42
47µF
R83
F1
R85
C50
R87
X7
1µ
C10
C14
47µ
C12
T1
C24
X2
1µF
C23
RE1
S3
BD1
BD2
TS21
C54
R102
TS25
TS14
TS16
R59
R13
A1
TS22
C55
R103
TS26
TS16
C53
X3A
C48
L1
L2
R70
C40
C41
R84
C43
47µF
R89
C46
10µF
R86
X5
C26
C25
C30
10µF
22µF
C52
R88
C100
C36
10µF
C37
220N
C38
220N
1µF
C33
C31
C16
X6
S2
S1
R69

* New component

FIGURE 1, PAGE 9
Version A
PCB COMPONENT LAYOUT FOR MODIFICATION OF THE 1x 100W MODULE

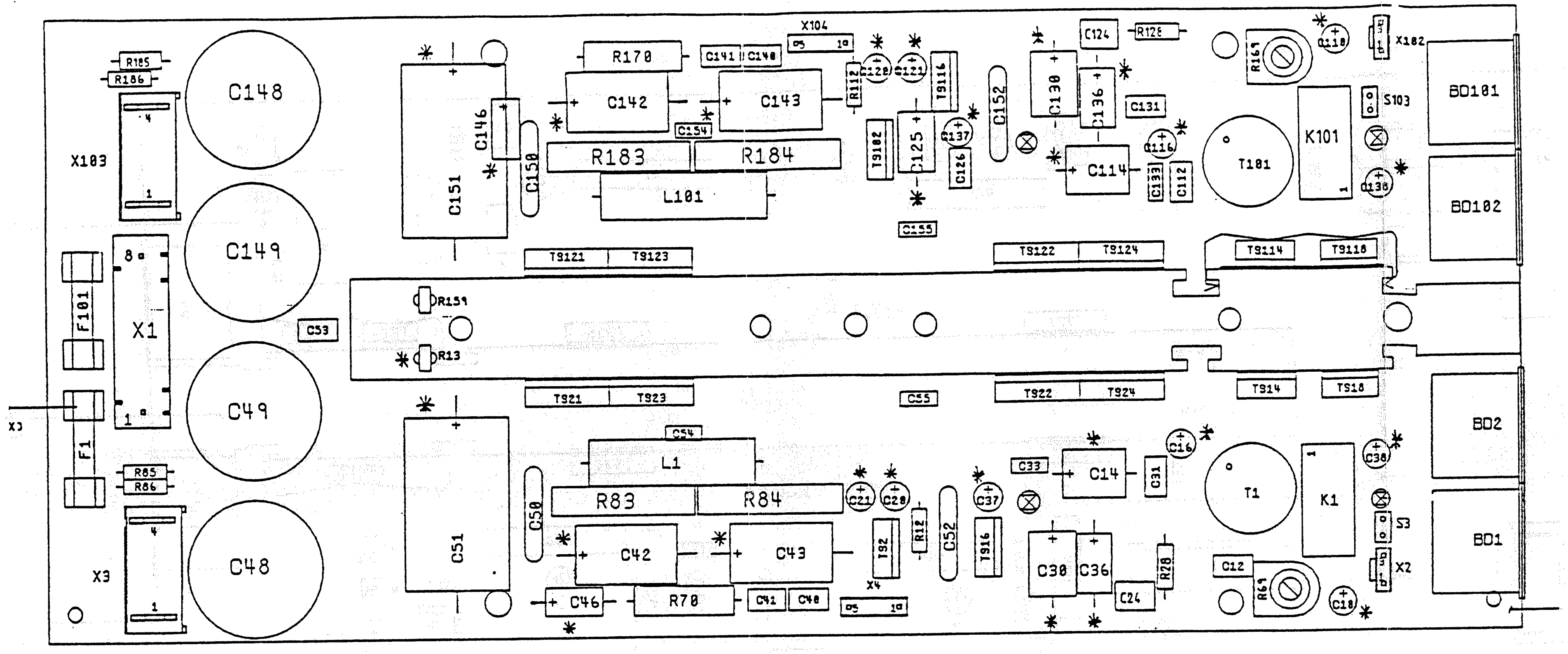

C49
C51
C48
X1
X4
X3H
F1
R85
C50
R12
TS2
C21
C20
C42
R83
R87
C14
C18
C12
T1
X7
R28
C24
X2
RE1
C23
S3
BD1
BD2
C54
TS21
TS23
R102
TS25
TS27
TS14
TS18
R59
R13
A1
C53
TS22
TS24
C55
R103
TS26
TS28
TS16
L1
L2
R70
C40
R84
C41
C43
R86
C46
C26
C25
C30
C52
R88
C100
C36
C33
C31
C16
C37
C38
X6
S2
S1
R69
X5

* Delete component

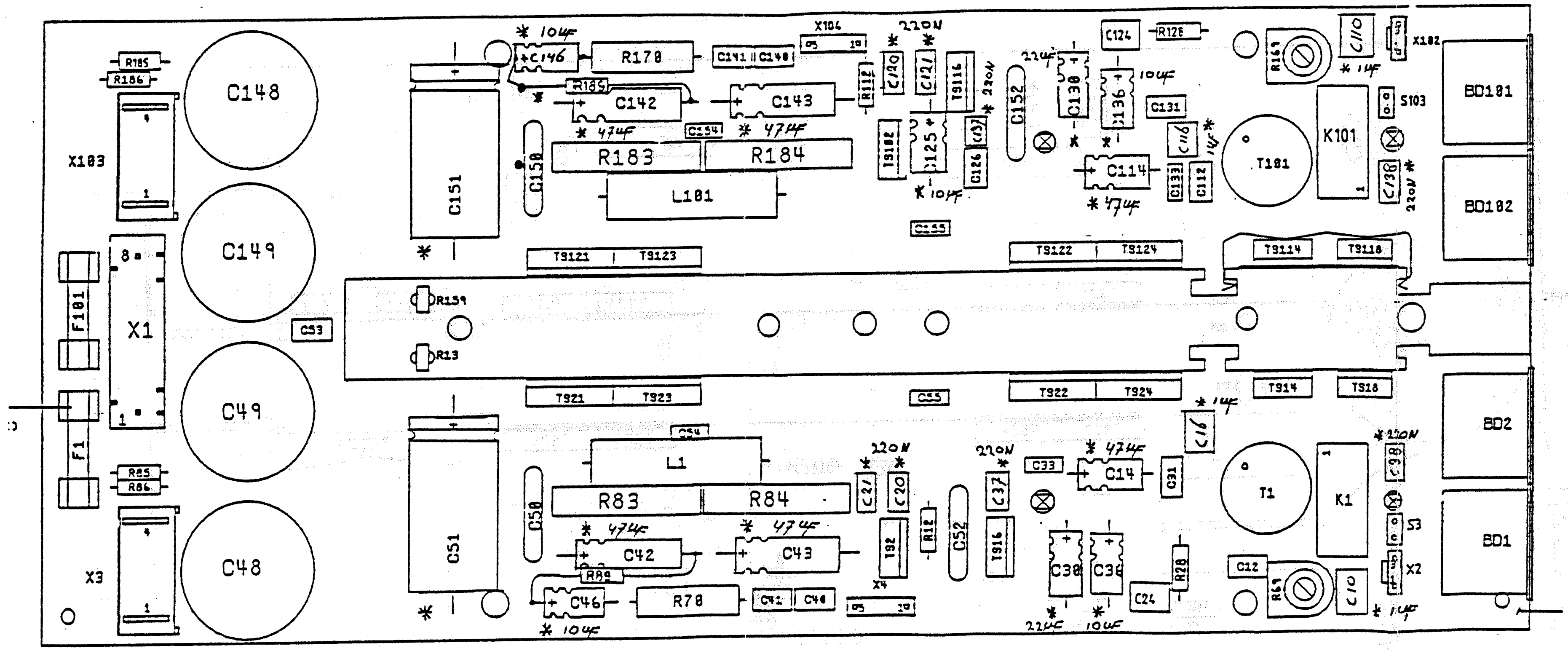

C49
C51
C48
X1
X4
X3H
F1
R85
C50
R12
TS2
220N
C21
220N
C20
C42
47µF
R83
R87
47µF
C14
1µF
C10
C12
T1
X7
R28
C24
X2
RE1
C23
1µF
S3
BD1
BD2
C54
TS21
TS23
R102
TS25
TS27
TS14
TS18
R59
R13
A1
C53
TS22
TS24
C55
R103
TS26
TS28
TS16
L1
L2
R70
C40
R84
C41
C43
47µF
R89
R86
C46
10µF
C26
C25
C30
22µF
C52
R88
C100
C36
10µF
C33
C31
C16
1µF
C37
220N
C38
220N
X6
S2
S1
R69
X5

* New component

FIGURE 2, PAGE 10
Version A
PCB COMPONENT LAYOUT FOR MODIFICATION OF THE 1x 200W MODULE

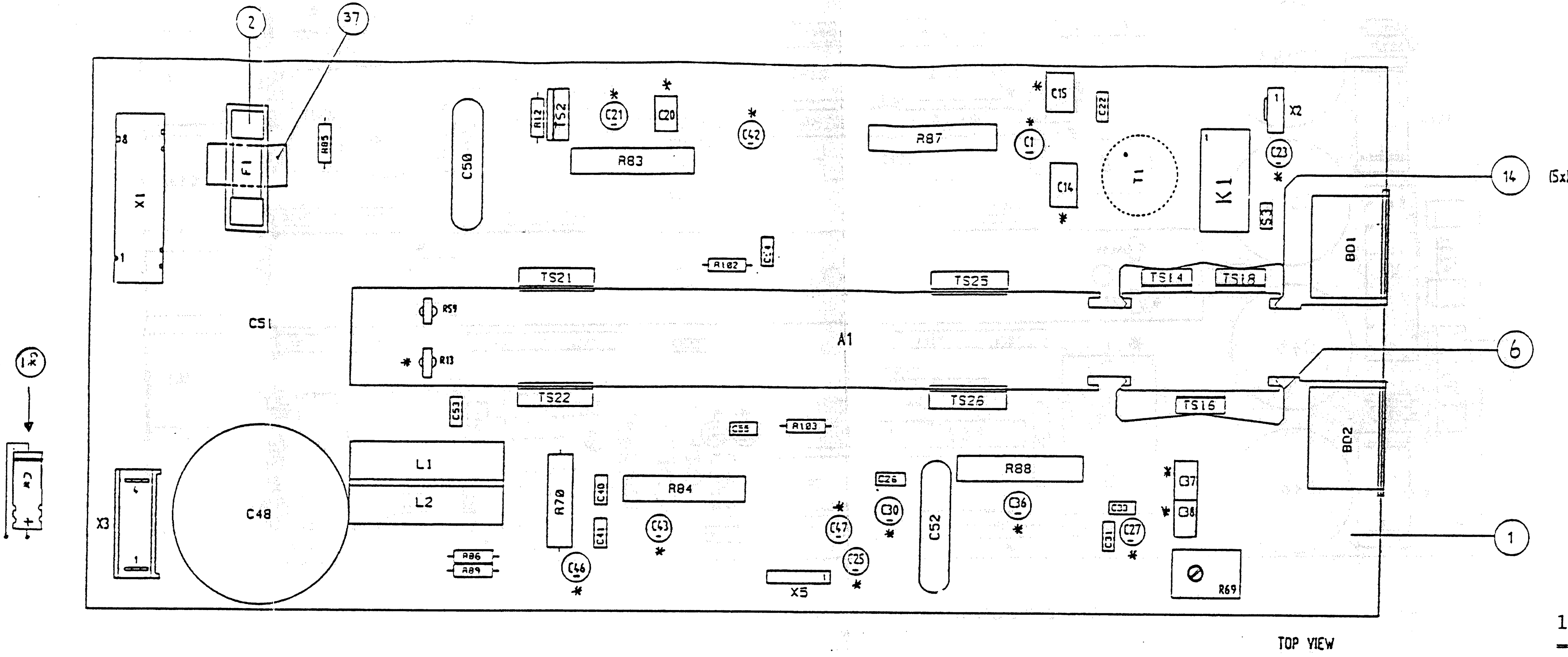

C148
C149
C49
C48
X103
X1
X3
F101
F1
R185
R186
R85
R86
C53
R159
R13
C151
C146
C150
C51
C50
R178
C142
C143
R183
R184
L101
C141
C140
C154
X104
R112
C120
C121
T9116
T9102
C125
C137
C126
C155
C152
C130
C136
C124
R126
C131
C114
C133
C112
C116
T101
R161
C118
X102
S103
K101
C138
BD101
BD102
T9121
T9123
T9122
T9124
T9114
T9118
T921
T923
C55
T922
T924
T914
T918
C54
L1
R83
R84
C42
C43
C46
R78
C41
C40
X4
C21
C20
R12
C52
T92
T916
C37
C33
C14
C31
C16
T1
K1
C38
S3
X2
BD2
BD1
C30
C36
C24
R28
C12
R61
C10

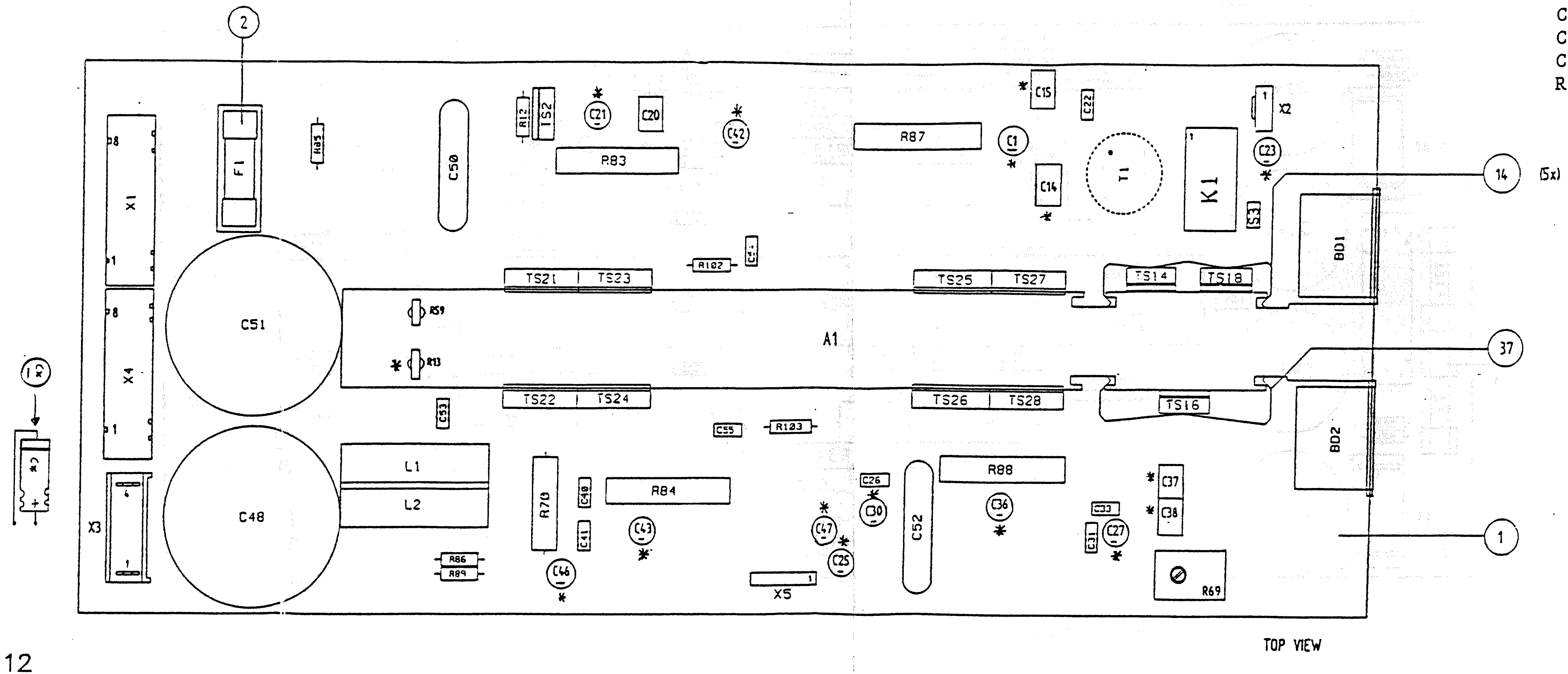
* Delete component


C148
C149
C49
C48
X103
X1
X3
F101
F1
R185
R186
R85
R86
C53
R159
R13
C151
C150
C51
C50
* 10µF
C146
R178
R189
C142
C143
* 47µF
* 47µF
R183
R184
L101
C141
C140
C154
X104
220N
R112
C120
C121
T9116
220N
220µF
C130
C136
10µF
C124
R126
C131
T9102
C125
* 10µF
C137
C126
C155
C152
C114
* 47µF
C133
C112
C116
14µF
T101
K101
C110
* 1µF
C138
220N
X102
S103
R161
BD101
BD102
T9121
T9123
T9122
T9124
T9114
T9118
T921
T923
C55
T922
T924
T914
T918
* 1µF
C16
* 220N
C38
C54
L1
R83
R84
* 47µF
C42
* 47µF
C43
R89
C46
* 10µF
R78
C41
C40
X4
220N
C21
C20
R12
C52
T92
220N
C37
C33
* 47µF
C14
T916
C31
C30
C36
220µF
10µF
C24
R28
T1
K1
S3
X2
BD2
BD1
C12
R61
C10
* 1µF

* New component

FIGURE 3, PAGE 11
Version A
PCB COMPONENT LAYOUT FOR MODIFICATION OF THE 2x 100W MODULE

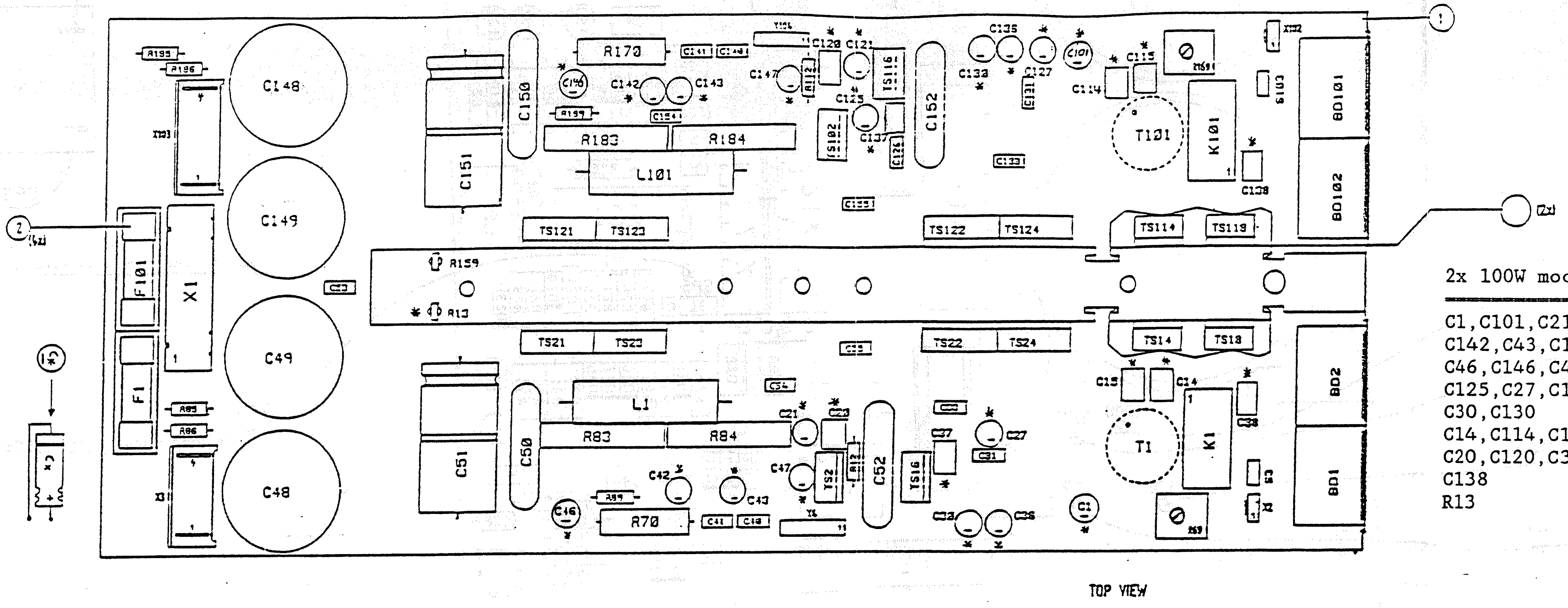

2
37
X1
F1
R85
C50
R12
TS2
C21
C20
C42
R83
R87
C15
C22
C1
C14
T1
K1
X2
C23
S3
14
(5x)
BD1
R102
C13
TS21
TS25
TS14
TS18
C51
R59
R13
A1
6
TS22
TS26
TS16
C53
C55
R103
BD2
X3
C48
L1
L2
R70
C40
R84
R88
C26
C37
C38
C30
C36
C33
C41
C43
C47
C52
C31
C27
C25
C46
R86
R89
X5
R69
1
TOP VIEW


2
X1
F1
R85
C50
R12
TS2
C21
C20
C42
R83
R87
C15
C22
C1
C14
T1
K1
X2
C23
S3
14
(5x)
BD1
R102
C13
TS21
TS23
TS25
TS27
TS14
TS18
X4
C51
R59
R13
A1
37
TS22
TS24
TS26
TS28
TS16
C53
C55
R103
BD2
X3
C48
L1
L2
R70
C40
R84
R88
C26
C37
C38
C30
C36
C33
C41
C43
C47
C52
C31
C27
C25
C46
R86
R89
X5
R69
1
TOP VIEW

1x 100W and 1x 200W module

C1,C21,C42,C43	:47uF/40V
C25,C27,C36,C46,C47	:10uF/63V
C23,C30	:22uF/63V
C14,C15	:1uF
C20,C37,C38	:220N
R13	:PTC 60°C

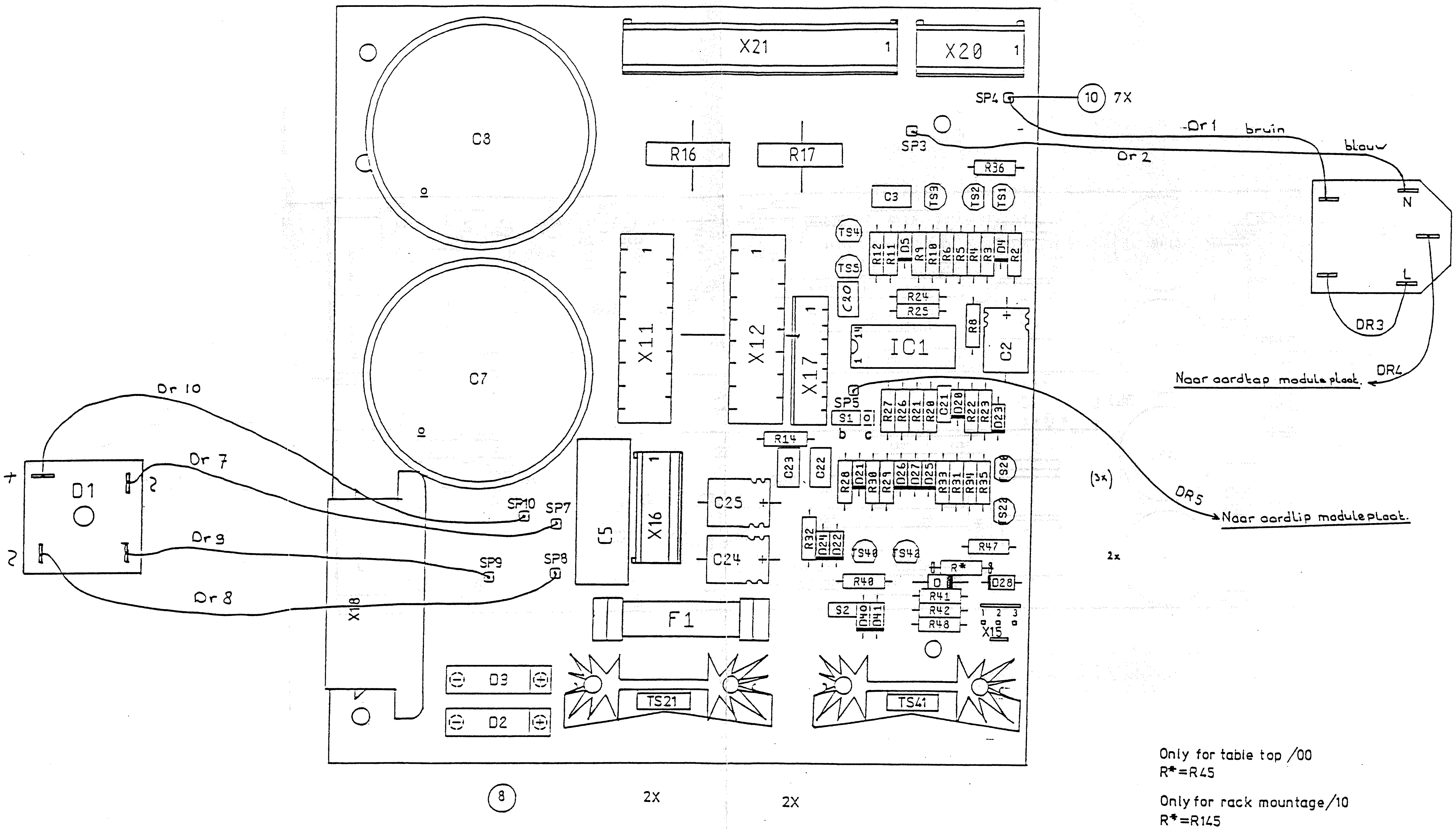
FIGURE 4, PAGE 12
Version B
PCB COMPONENT LAYOUT FOR MODIFICATION OF THE 1x 100W– AND 1x 200W– MODULE


1
2
(2x)
C148
C149
C49
C48
X1
F101
F1
R195
R196
R85
R86
C150
C151
C50
C51
R170
R183
R184
L101
L1
R83
R84
R70
R159
R13
C152
C52
C135
C133
C127
C101
C115
C114
C138
C142
C143
C146
C147
C128
C121
C125
C137
C42
C43
C46
C47
C21
C27
C15
C14
C38
C1
T101
T1
K101
K1
BD101
BD102
BD2
BD1
TS121
TS123
TS122
TS124
TS114
TS113
TS116
TS21
TS23
TS22
TS24
TS14
TS13
TS16
TS2
TOP VIEW

2x 100W module

C1,C101,C21,C121,C42
C142,C43,C143 :47uF/40V
C46,C146,C47,C147
C125,C27,C127,C36,C136:10uF/63V
C30,C130 :22uF/63V
C14,C114,C15,C115 :1uF
C20,C120,C37,C137,C38
C138 :220N
R13 :PTC 60°C

FIGURE 5, PAGE 13
Version B
PCB COMPONENT LAYOUT FOR MODIFICATION OF THE 2x 100W MODULE


X21
X20
SP4
10
7X
SP3
Dr 1
bruin
Dr 2
blauw
N
L
DR3
DR4
Naar aardtap module plaat.
C8
C7
R16
R17
R36
C3
TS3
TS2
TS1
TS4
TS5
R12
R11
D5
R9
R10
R6
R5
R4
R3
D4
R2
C20
R24
R25
R8
IC1
C2
X11
X12
X17
SP5
S1
b
c
R27
R26
R21
R20
C21
D20
R22
R23
D23
R14
C23
C22
R28
D21
R30
R29
D26
D27
D25
R33
R31
R34
R35
S29
S24
(3x)
DR5
Naar aardlip module plaat.
2x
Dr 10
Dr 7
Dr 9
Dr 8
D1
+
2
SP10
SP7
SP9
SP8
C5
X16
C25
C24
R32
D24
D22
TS40
TS42
R47
R*
R40
D
D28
S2
D40
D41
R41
R42
R48
1 2 3
X15
F1
X18
D3
D2
TS21
TS41
8
2X
2X
PC BOARD
3922 101 9115C

Only for table top /00
R*=R45

Only for rack mountage/10
R*=R145

FIGURE 6, PAGE 14
Version A and B
PCB COMPONENT LAYOUT FOR MODIFICATION OF THE REM- AC/DC POWER SUPPLY MODULE